Construction Methods

July
1927

McGraw-Hill Publishing Company, Inc., New York, N. Y.

Building Testing Track
of General Motors
at Milford, Mich.

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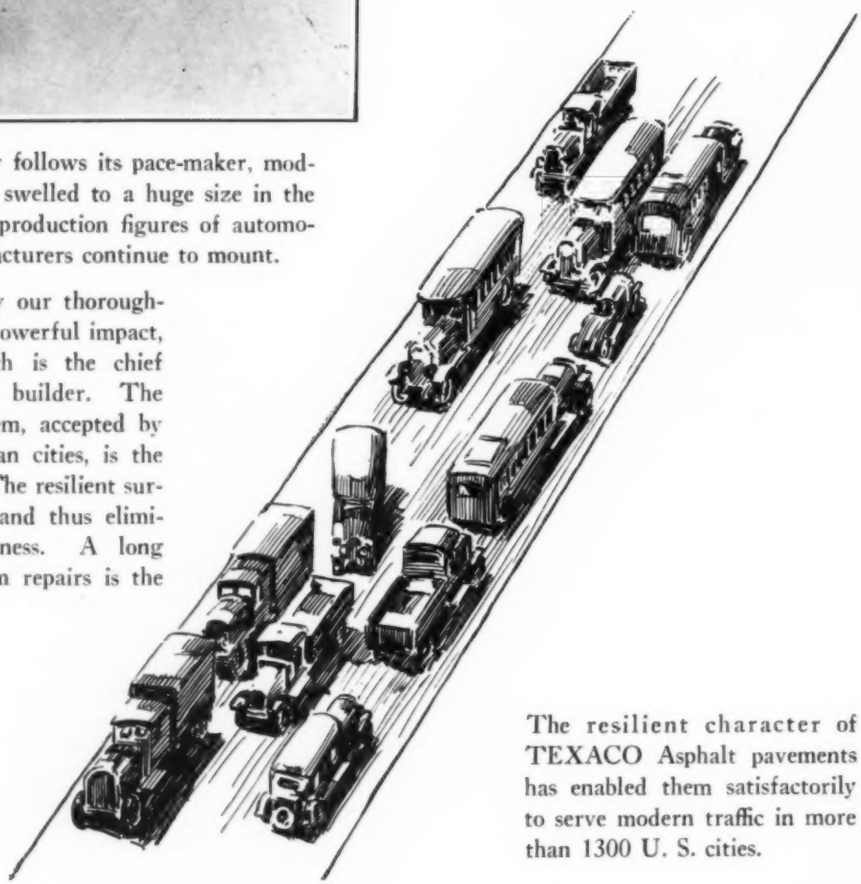

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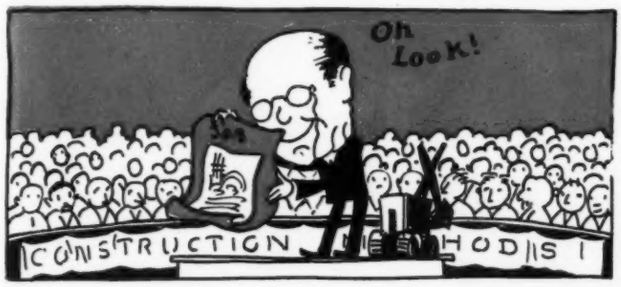
Construction Methods, July, 1927, Vol. 9, No. 7. Published monthly. McGraw-Hill Publishing Company, Inc., Tenth Ave. at Thirty-sixth Street, New York, N. Y. Two years for $1; per copy, 5 cents. Entered as second-class matter October, 1926 issue, Vol. 8, No. 10, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Construction
Methods

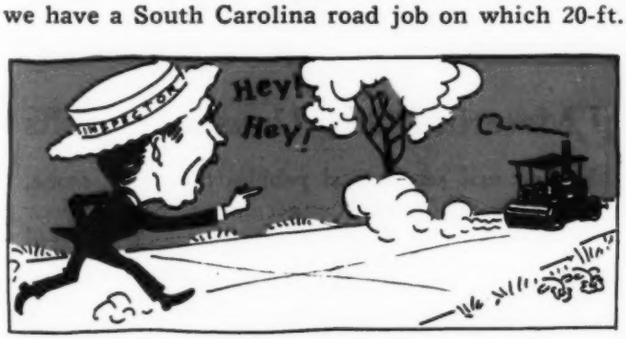
Hitting the High Spots

EVERY now and then we have volunteered the information that this magazine's chief mission in life is to do what its readers want it to do. Some of them seem to have taken us at our word and have decided that *Construction Methods* should be



a sort of arena in which construction men can display their skill and write their records where all can see. We're willing to accept the job, and in this issue you will find at least three articles in which just pride in a good job is duly recorded, with an implied challenge to our other readers to speak up if they have anything better to offer.

ALL three of these noteworthy performances are in the highway game. On pages 32 and 33 we have a South Carolina road job on which 20-ft.



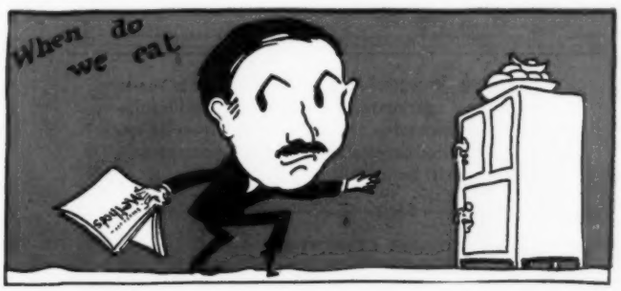
concrete pavement is being put down so fast that the inspector hardly has time to argue with the contractor. Then we have a brawny trio from New Hampshire (pages 22-23) whose boss is willing to back them in the gentle art of laying a Telford base. And on page 8 is a champion pavement bricklayer from Georgia. He is a real champion in every sense of the word, for he is earning his way in the world despite a physical handicap that would be considered a total disability by many men.

OUR pages are wide open for contests such as these. Any reader who is making a record in his line of construction will find us ready and willing to spread the good news throughout the industry. The highwaymen are off to a flying start. Let's see what the others have to say for themselves.

THIS issue isn't confined to record breakers, however. There are the usual number of plain everyday jobs—the kind that all of us are working on, and which rarely get the publicity they deserve.

After all, it is the man who is doing the prosaic, ordinary job and doing it well who is the strength of the great construction industry. *Construction Methods* never will allow itself to get so wrapped up in the unusual that it will neglect the usual. If you find us doing that, just shout at us and we'll come back home and try to behave.

BY the way, don't read this issue when there is no food close at hand. Those "When do we eat" pages (34-37) are likely to make you hungry,



and far be it from us to arouse an unappeasable appetite. When you read these pages, you will see that everything is done to prevent such a calamity in an up-to-date construction camp.

Construction Methods

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and

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For 52 years, the McGraw-Hill Publishing Company, Inc., has been serving the civil engineering and construction world through the pages of *Engineering News-Record*, the recognized authority in its field.

However, it has been apparent that despite the wonderful service that *News-Record* is rendering its army of readers, there is still a big opportunity for a special service—for another publication edited especially for outside men in construction, maintenance and material handling.

It is to serve this vast number of field men that the McGraw-Hill Publishing Company edits *Construction Methods*. In order to make the paper of highest value and greatest convenience to *you*, a busy practical man, the publishers of *News-Record* decided to make *Construction Methods* a pictorial tabloid—designed to show you by photographs and concise data the things you should know to keep abreast of the latest developments in your field.

Every issue of *Construction Methods* has more than 40 interesting, instructive pictures, that show how highways are being built and maintained; how railroad maintenance-of-way problems are handled, how public works, sewers, pavements, waterworks are built and operated, how irrigation problems are handled the world over; how bridges are put up, how docks, dredges, water power developments, canals, tunnels and hosts of similar details are handled under every conceivable condition and in the face of the most diverse obstacles. These pictures are practical, interesting and constructive. They are chock-o-block full of the experiences, ideas and suggestions of other construction men in your field.

Construction Methods under McGraw-Hill leadership is being enthusiastically received by field men everywhere. The low charter subscription price of $1 for a three-year subscription is especially popular—36 monthly issues at a cost of less than 3c. an issue is recognized as a great bargain and is eagerly snapped up by these outside men.

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The charter subscription coupon below therefore is worth 50c.—pin a dollar bill to it and mail it back to us and we will enroll you as a charter subscriber for the next three years.

A few Field Men's Opinions of Construction Methods

Construction Methods impresses me very favorably—much more so than a lot of construction magazines—as it seems your paper is for field men and shows actual field practice which is much more interesting to us than a lot of dry theory.

I am going to try a spray (as shown in a previous number) for applying the waterproofing to a concrete surface as a protection to the abutments and piers in Florida. If it works successfully, we will be glad to give you photographs of the spray in action.

(*Signed*) H. PAUL KULE,
Supt. Concrete Steel Bridge Co., of Florida.

Gentlemen:
Notice your offer regarding sample copies of *Construction Methods*. Understand your charter member price is $1. Enclosed find check to cover. Will not need sample. *Engineering News-Record* is good enough sample. Read it every week, though not a subscriber. Have it on file here.

(*Signed*) GEORGE FOX,
Martinez, Calif.

Gentlemen:
Surely worth the money. Very interesting and instructive.

(*Signed*) HARRY FIRSTBROOK,
Manager, Temple Gas Co.,
Temple, Texas.

I can't get along without your magazine. Good luck to all. Also want to thank the McGraw-Hill management for size of last issue.

(*Signed*) GEORGE ALLEN,
Road Construction,
Polk County,
Crookston, Minn.

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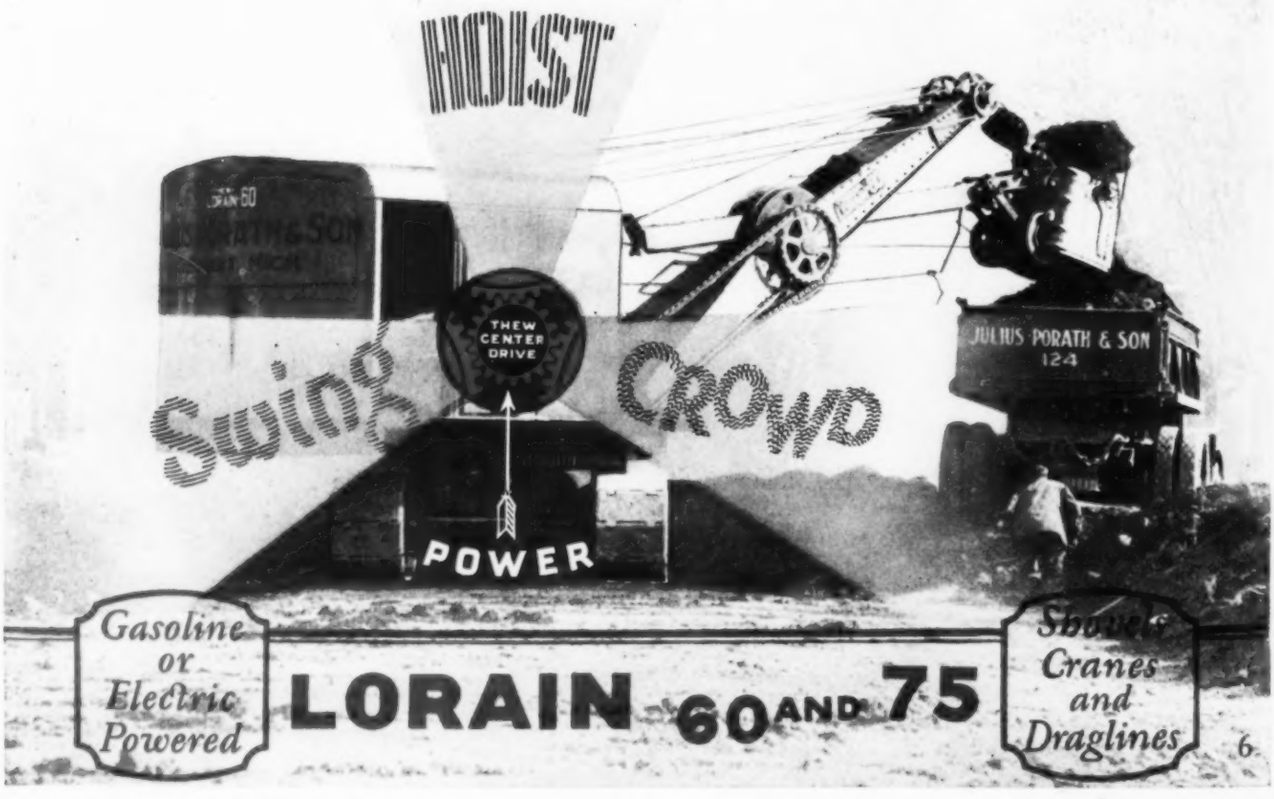


Construction Methods

McGraw-Hill Publishing Company, Inc.
JAMES H. MCGRAW, *President*
E. J. MEHREN, *Vice-President*

A Monthly Pictorial of Field Practice and Equipment Illustrating Successful Construction, Maintenance and Material-Handling Methods for General Construction, Highways, Buildings, Industrial Plants and Public Works and Utilities

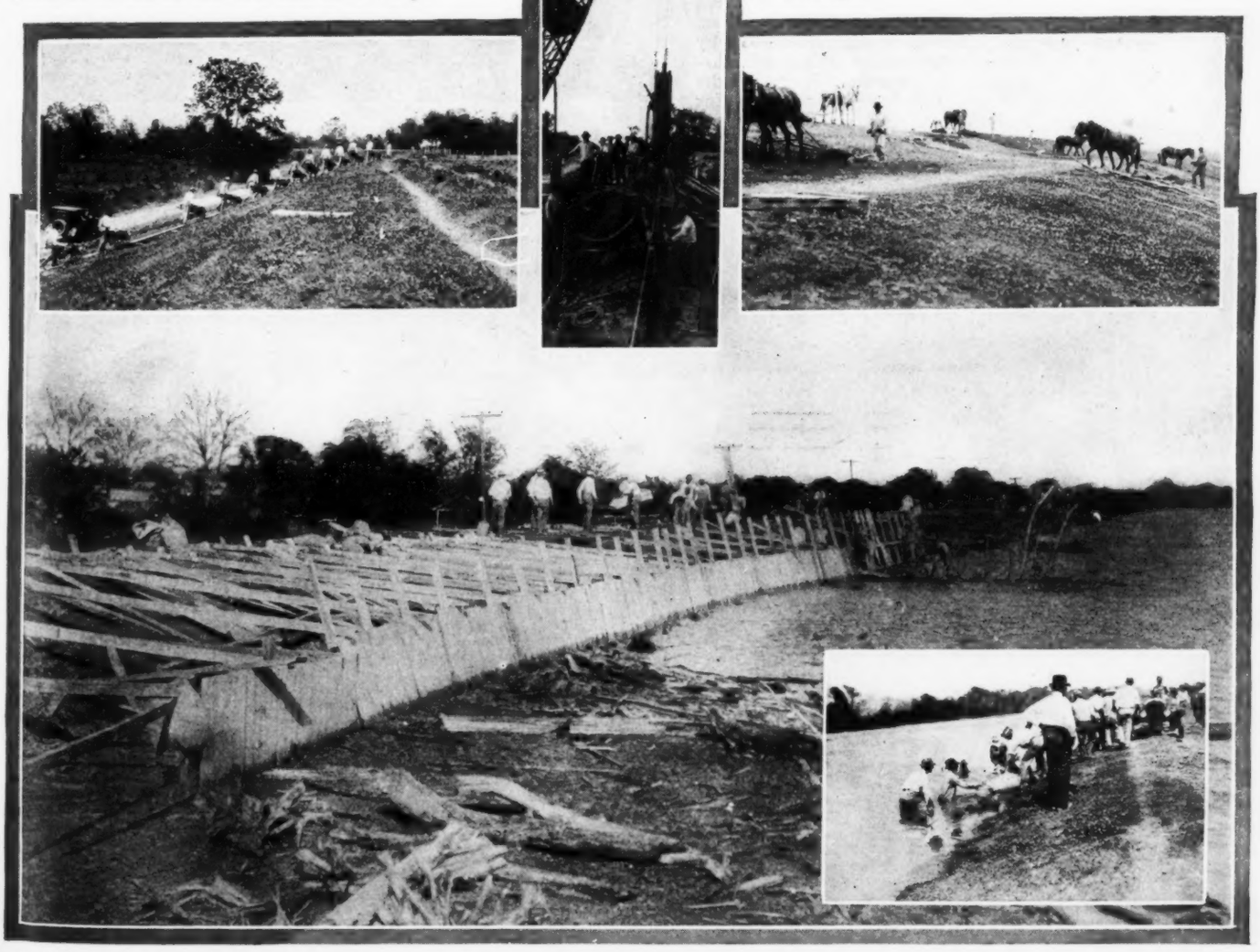
WILLIAM JABINE
Editor

VOLUME 9 NEW YORK, JULY, 1927 NUMBER 7

Construction Heeds the Call

CONSTRUCTION men and construction methods have been doing their full share in the flood regions of the lower Mississippi during the last two months. The direction of the work of holding back the waters has been in their hands, and they have had the added problem of managing a large number of unskilled workmen who volunteered their services in the great emergency. The work of protecting levees has been largely carried on by hand labor, although now and then, it has been possible to utilize construction machinery.

The photographs on this page show various scenes along the Mississippi at the time when every man was working night and day to preserve the levees. They give a good idea of the way in which the work was handled. The humble wheelbarrow did yeoman work in the fight. Steel hammers were used for driving sheeting to prevent seepage. Horse-drawn scrapers were used to raise the levees, and all along the line men piled thousands of sand bags at points where the floods threatened to break through.



Construction

Above—When corrections were made in the lettering on a war memorial at Toronto, a Sullivan compressor and pneumatic tools were called into service

At left—On his recent trip to the Antipodes, the Duke of York laid a record number of cornerstones. This one was for the Nurses' Memorial Chapel in New Zealand

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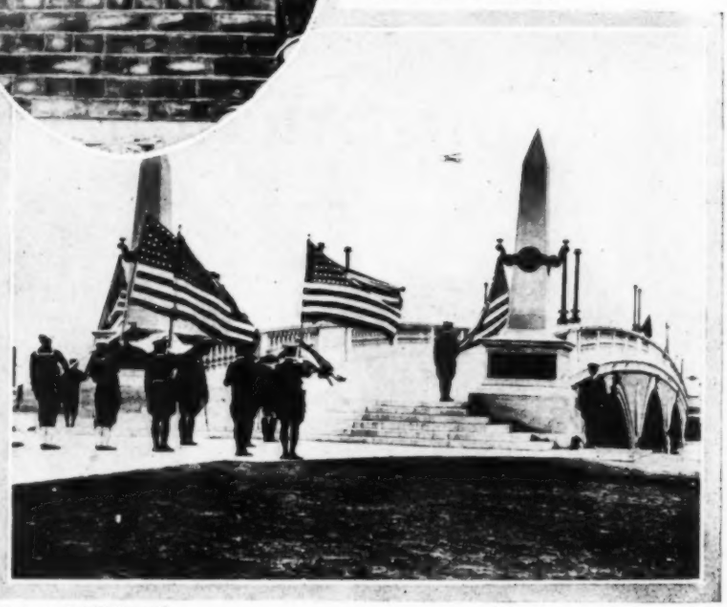

At right—The John W. Weeks Memorial Bridge, named in honor of the late Secretary of War, was dedicated recently by Governor Fuller of Massachusetts. It crosses the Charles River and is for pedestrians only

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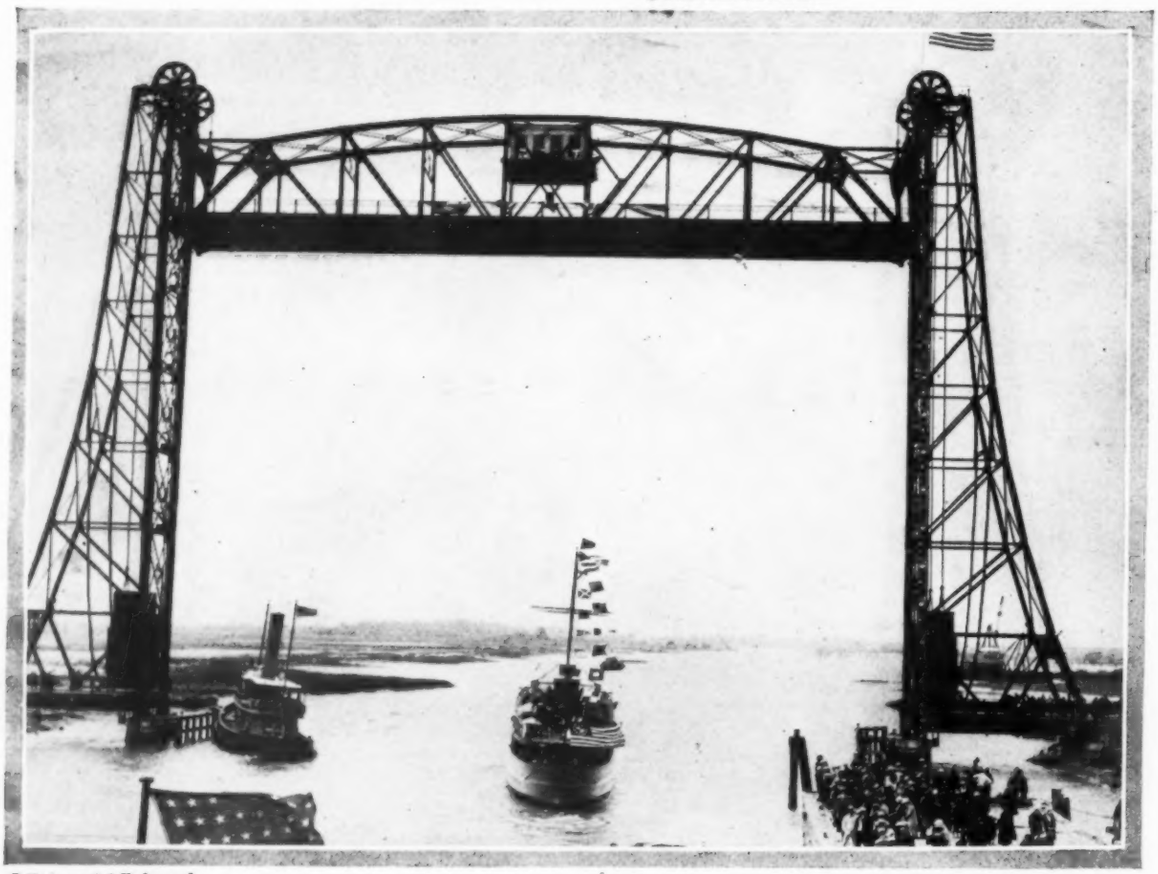

At left—Elaborate ceremonies marked the opening of the Chesapeake and Delaware sea level canal. President Coolidge pressed a button in Washington which operated the lift bridge and permitted Governor Miller of Delaware to lead a flotilla into the new canal

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Fills the Public Eye

Below — At the opening of the Carquinez Bridge. Three governors are shown at the right releasing pigeons. The trio of executives are: Left to right: Governor Balzar of Nevada, Governor Young of California and Governor Patterson of Oregon

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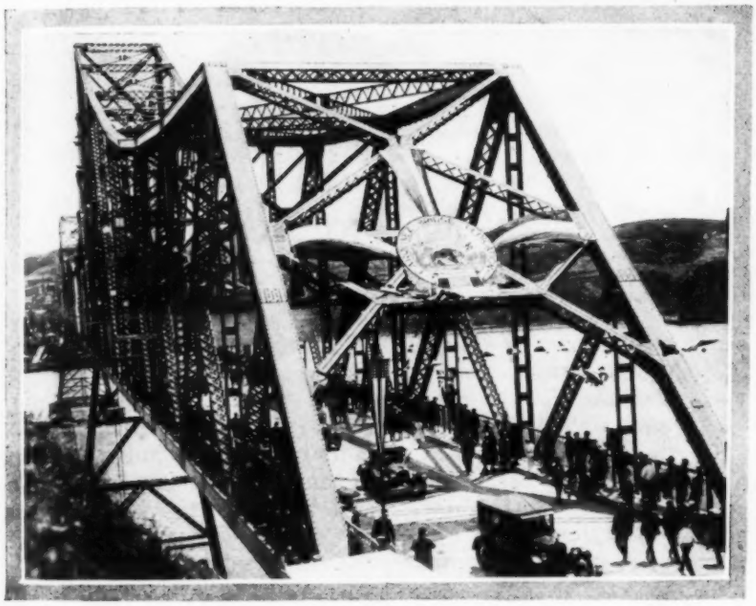

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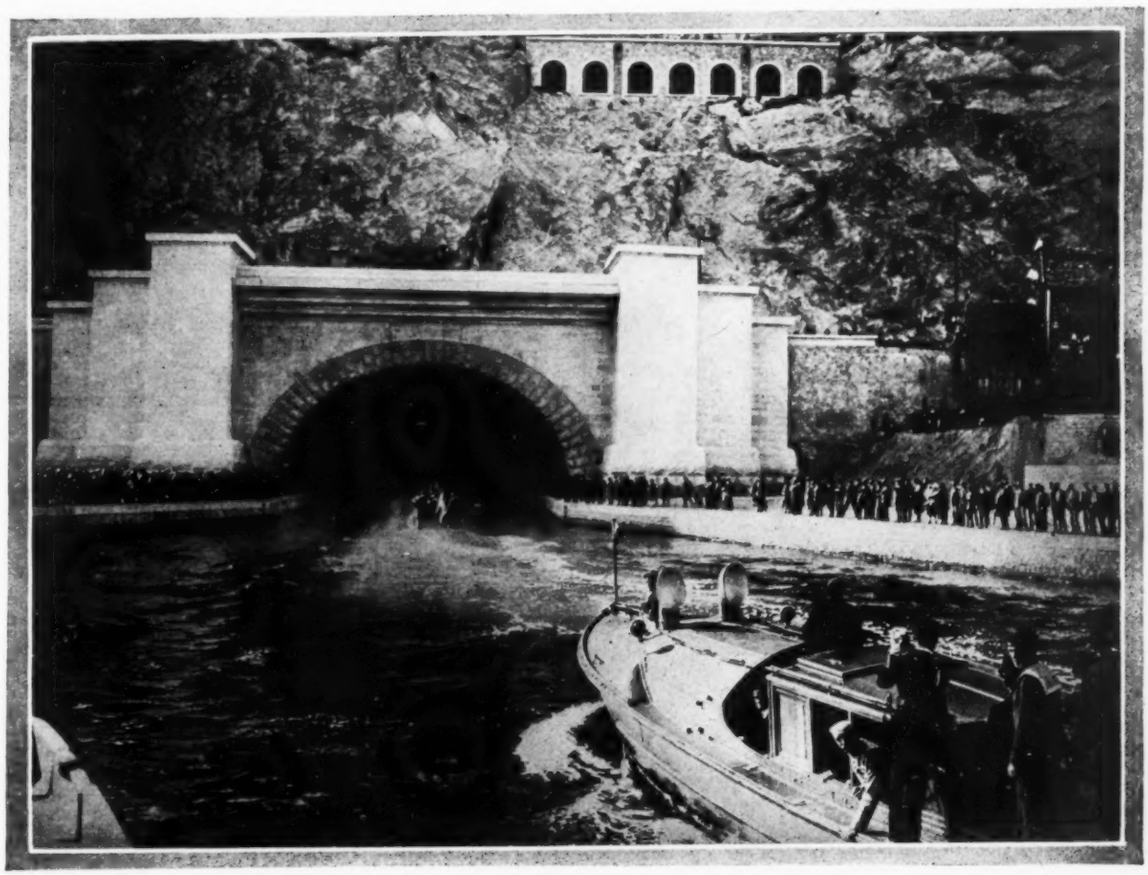
Above—Park Avenue, which has acquired in the last few years the reputation of being New York's wealthiest thoroughfare, is undergoing extensive alterations. The avenue is built directly over the New York Central tracks, and the work of reconstructing and widening the roadway is not as easy as it looks. Everything has to be done without interfering with the trains which pass underneath

At right — President Doumergue of France officiated at the opening of the Rove Canal at Marseilles. This great piece of engineering, recently completed, includes a marine tunnel nearly 5 miles long under a mountain. Great crowds watch the ceremonies



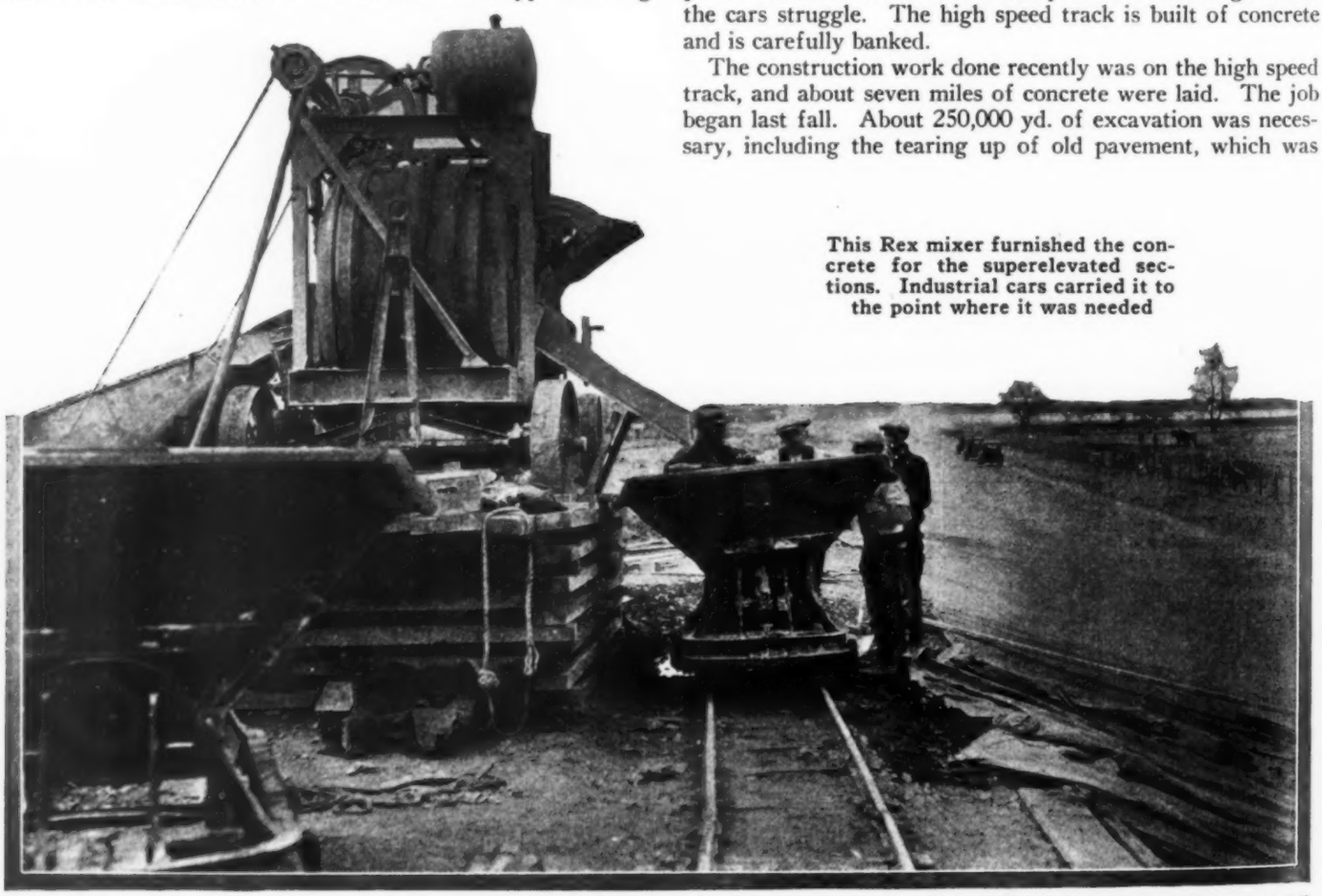
Where Quality Counts

Roads on General Motors Proving Ground Must Be Built Right

ONE of the most interesting and important road construction jobs in the United States was handled recently by the C. A. Handeyside Construction Co. of Detroit. The reconstruction of certain sections of the General Motors Proving Ground near Milford, Mich., was entrusted to the Handeyside organization.

The General Motors Proving Ground consists of a tract of varied country 1,245 acres in extent. On this land have been constructed a series of roads of different types running all the way from a stretch of unimproved country road to a concrete straightaway 1½ miles long, that is perfectly straight and level for the entire distance. This stretch of road was built with the greatest care and is an important unit in the process of testing cars. Grades on the roads in the Proving Ground run as high as 24 per cent. The surfaces of various sections are: concrete, gravel treated with tar, untreated gravel, brick and an ordinary unimproved dirt road. At one point there is a short stretch of deep sand road through which the cars struggle. The high speed track is built of concrete and is carefully banked.

The construction work done recently was on the high speed track, and about seven miles of concrete were laid. The job began last fall. About 250,000 yd. of excavation was necessary, including the tearing up of old pavement, which was



This Rex mixer furnished the concrete for the superelevated sections. Industrial cars carried it to the point where it was needed

handled by steam shovels. The paving was done with two machines. A Koehring 1-yd. paver laid the main section of the track, and a smaller Rex paver was used for the superelevations. An Ord finisher with a span of 30 ft. followed the pavers. Gravel for the concrete was obtained within the Proving Ground. Industrial cars were used in distributing the concrete.

A Koehring paver at work on the high speed track. Cars are undergoing tests in the background

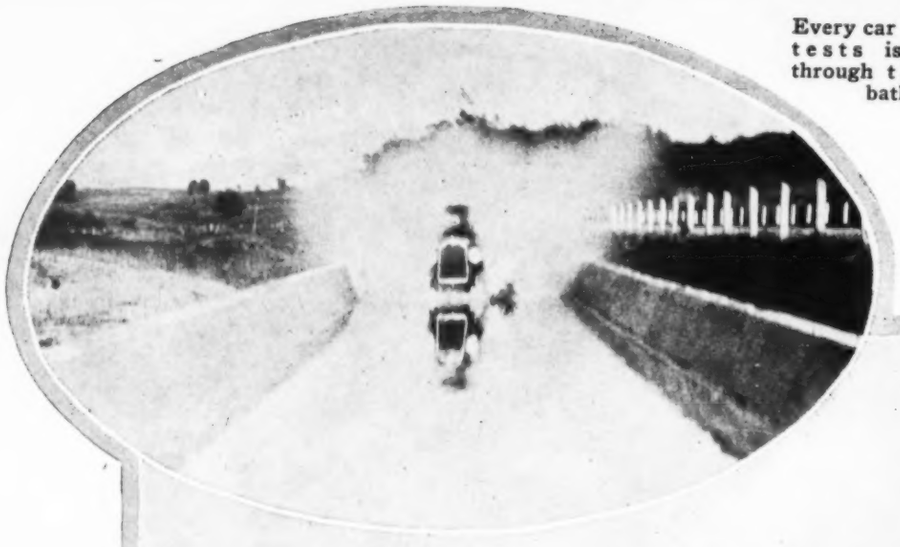
As may be seen from the photographs that accompany this article and also the one that appears on the cover of this issue of *Construction Methods*, the reconstruction work was carried on with as little interference as possible with the work of testing cars. In nearly every picture cars may be seen undergoing their tests. All of the roads on the Proving Ground have been built with the utmost care because the engineers in charge realize that in order to obtain accurate data which will be of real service to them, they must have well-built roads. The Michigan Highway Department was consulted in regard to the design of the roads on the Proving Ground and ever since the department's help has frequently been sought.

The tests made on the Proving Ground are both varied and thorough. A car is usually run 25,000 miles before the tests on it are considered complete, and during this time it runs night and day over the Proving Ground highways. A well-equipped maintenance organization has been established at the Proving Ground in order to keep the roads in shape. The gravel roads, of course, require considerable maintenance, and the concrete sections come in for their share of attention. The stiffest grades are on the gravel roads, but on the concrete track there are grades of 7 and 9 per cent and there is one long hill with a grade of 11.6 per cent.

The hill climbing tests through which the cars are put are severe. With a 450-lb. load they start up the hills at different speeds and accurate records of their performances are kept. The fuel economy tests also are important. Cars are run at various speeds ranging from 10 miles per hour to 55 miles per hour and the amount of fuel used is carefully measured.

C. Handeyside has been in charge of the work done re-

Ripping up old concrete with an Erie shovel. The old reinforcing is proving its strength



Every car undergoing tests is driven through the famous bathtub

A general view of the Proving Ground showing one of the hills up which the cars climb. Standard guard rails may be seen on the curves

cently at the Proving Ground and E. C. Taylor is the engineer in charge. About 150 men have been employed on the work. In charge of the Proving Ground for the General Motors Co. is C. S. Mott, Vice-President of General Motors. W. J. Davidson is Secretary of the General Technical Committee, and C. F. Kettering is Vice-President in charge of research.

A Credit to the Construction Industry

UNDETERRED by the fact that he lost both legs in a railroad accident, Charlie Larry has gone right ahead earning his living. Not only that, but he has set a pace in his chosen field of work which others find it hard to follow. For the last ten years he has been working as a paver for the Georgia Engineering Co. of Augusta, Ga., and can lay 700 yd. or 28,000 brick in a 9-hour day. He was hired by

Y. Briddell, superintendent of the Georgia Engineering Co., at Sumter, S. C., in 1916. To quote Mr. Briddell: "He has been with the company ever since, working every day and is always on the job. Instead of begging, he has earned his living by hard work." This picture was sent to *Construction Methods* by Mr. Briddell who feels that Charlie Larry deserves recognition by the construction industry.

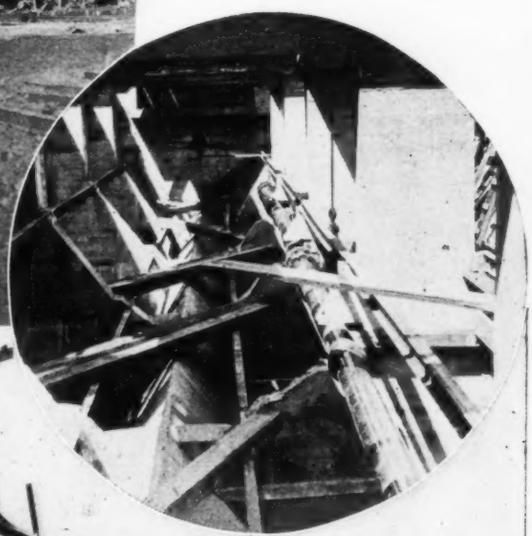
BLUE BOOK

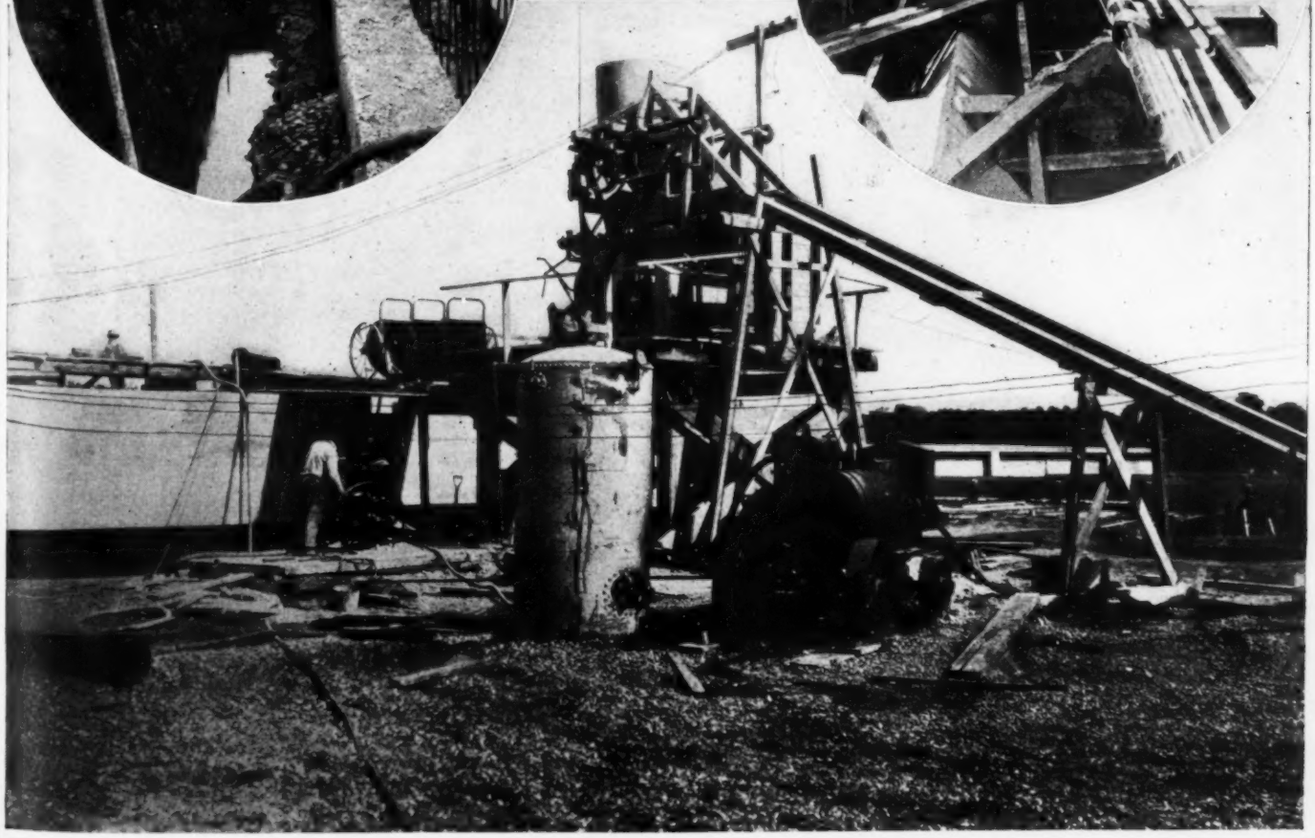
Oklahoma City Completes New Sanitation Program

Oklahoma City is spending nearly $1,000,000 in building two new sewage disposal plants and main sanitary sewer extensions. The north plant, which will have one Imhoff tank, is being built by Leo C. Sanders, who also is building the north side sewer.

The south disposal plant contains six Imhoff tanks. The Boardman Co. is building the south plant, and the Green-Boots Construction Co. is constructing the south side sewer extension. All three contractors are from Oklahoma City. B. M. Hart, City Engineer, is supervising the work. The consulting and designing engineers are Pearse, Greeley & Hansen of Chicago. Both plants are just about finished.

The concreting plant in the upper photograph is that which has been building the south disposal plant. Below is an unusual concreting outfit which has been at work on the north plant. It consists of an old Foote steam paving mixer readjusted for electric power. Materials are hoisted up the skip and dumped into a hopper over the mixer. The photograph in the circle at the left shows a cofferdam built at the south plant and that at the right the interior of an Imhoff tank before the baffle wall forms were placed.

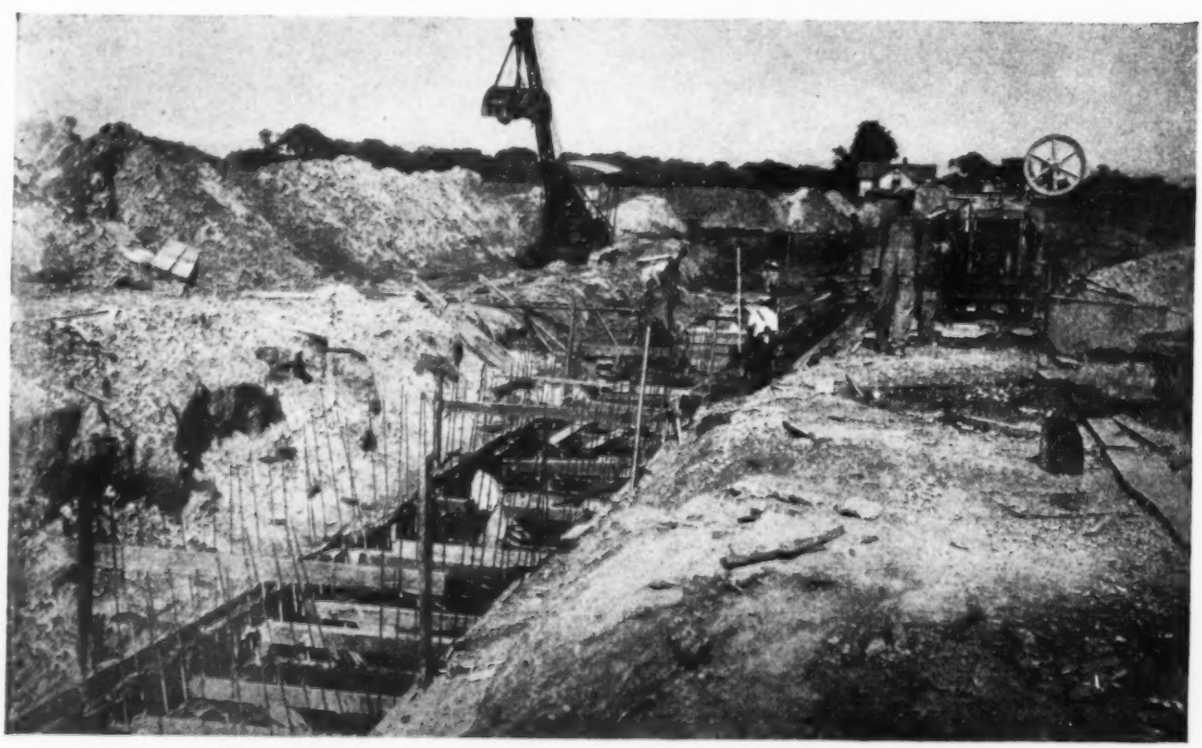




BLUE BOOK

Oklahoma City Completes Sanitation Program

This Erie Crane equipped with a Page bucket dug part of the north side sewer trench

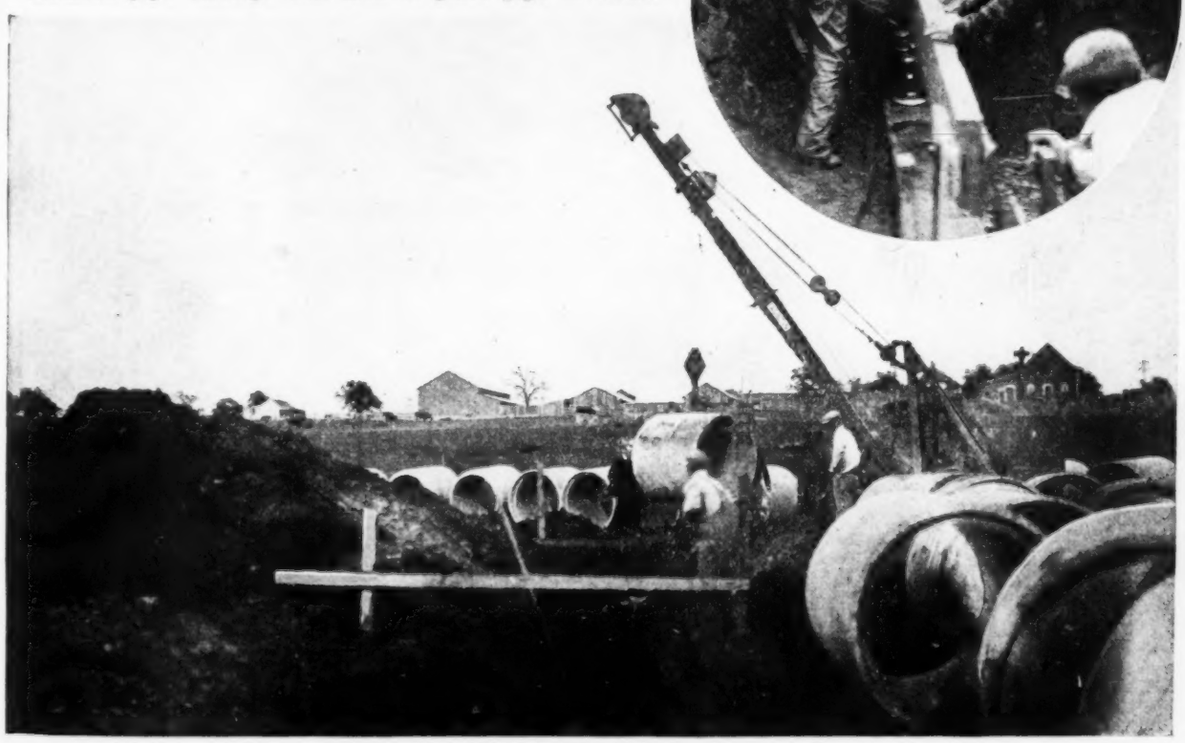


Wood sheeting was used on a sandy section of the south side sewer

BLUE BOOK

Oklahoma City Completes Sanitation Program

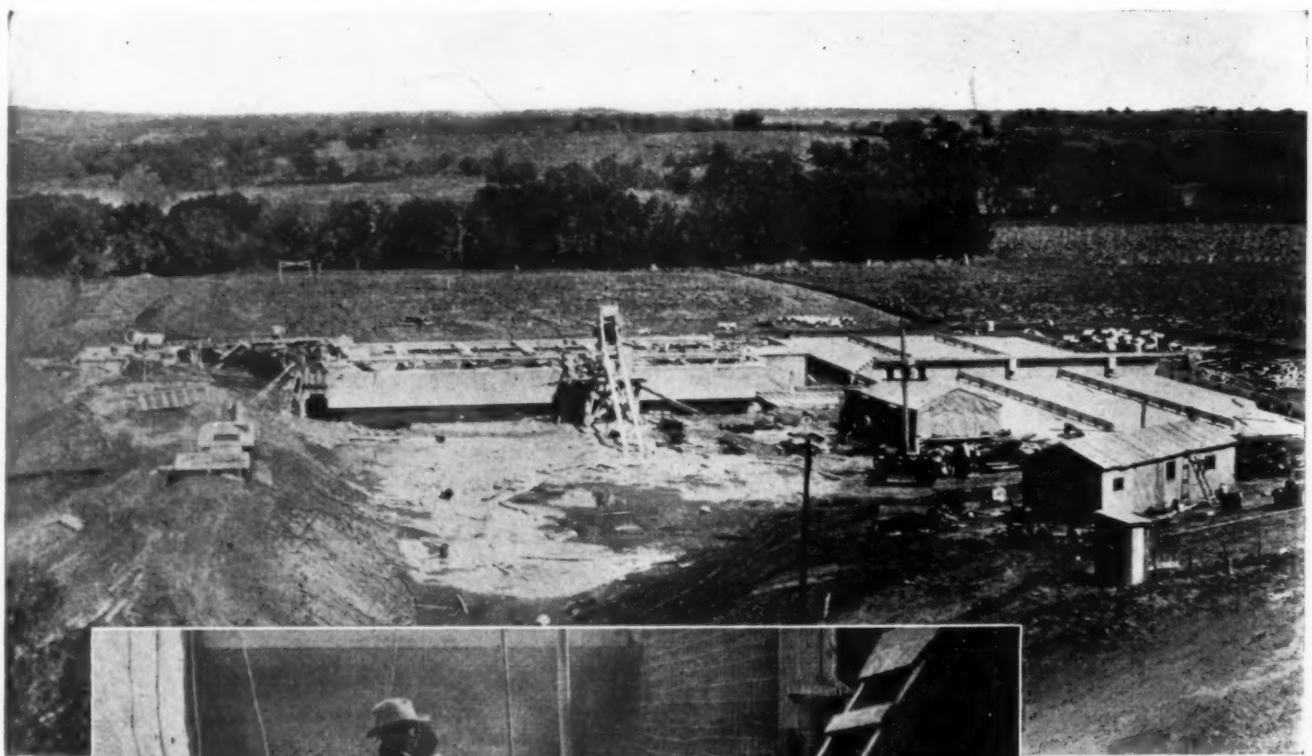
Lowering concrete pipe into ditch. In circle—Counterbalanced pipe carriage was used to place pipe in tunnel



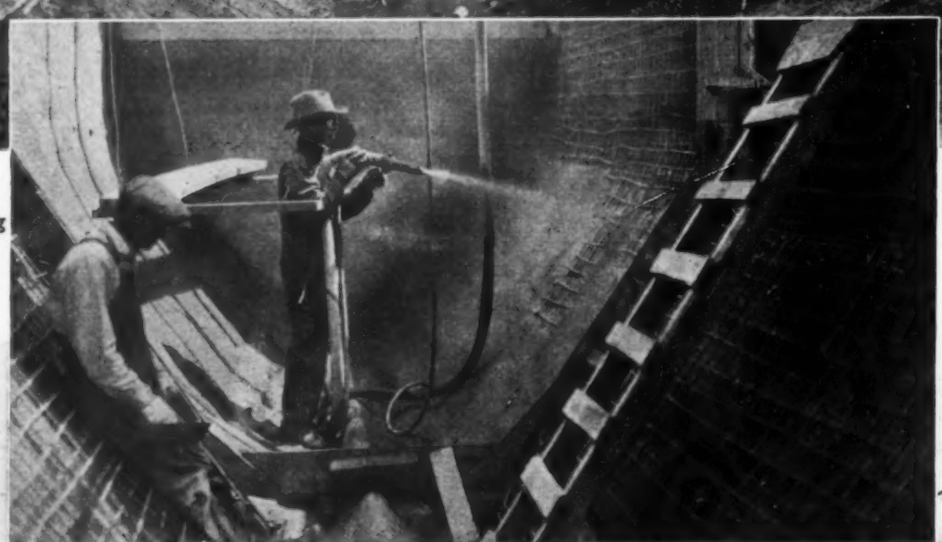
This Austin backfiller handled much of the pipe

BLUE BOOK

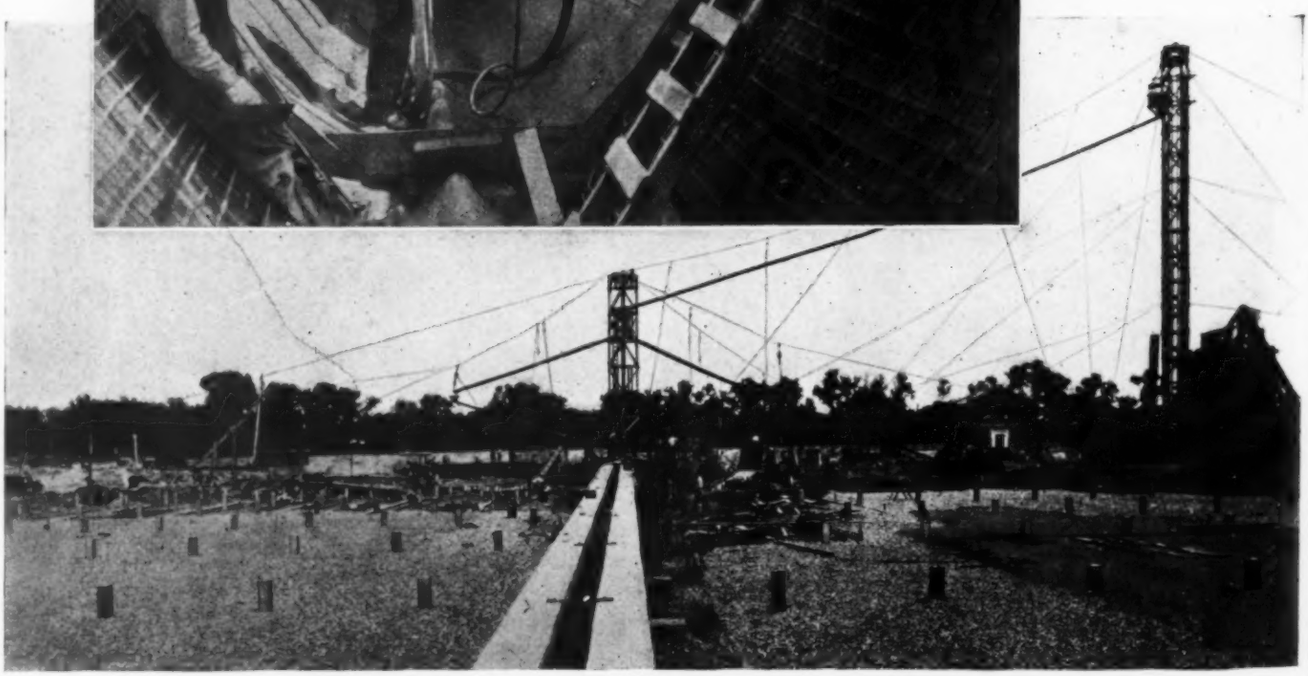
Oklahoma City Completes Sanitation Program



North plant. Imhoff tank at left. Sludge beds at right



Guniting baffle wall



Concreting plant pouring Imhoff tanks for south plant

Team Work Counts on Sewer Job

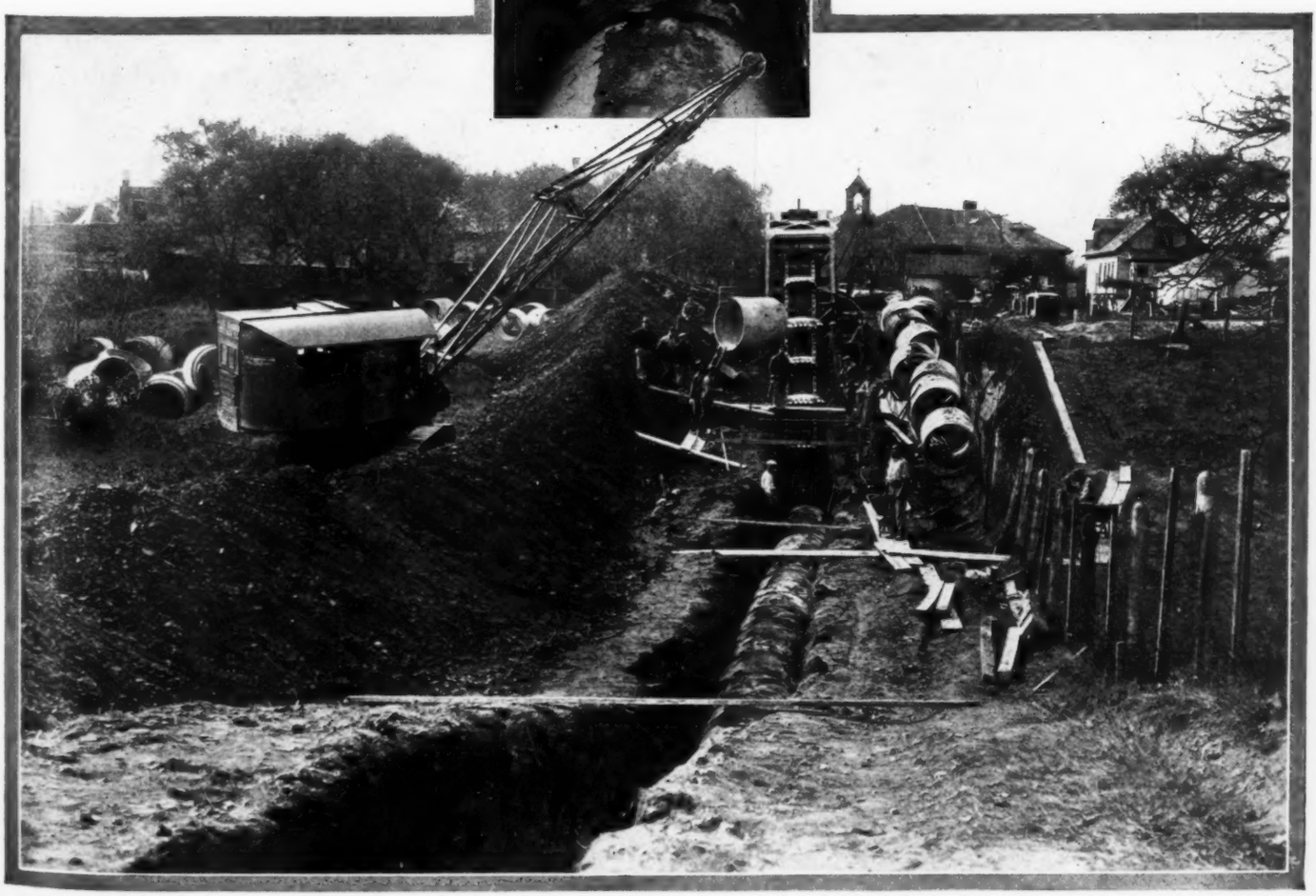
THE rapid growth of Chicago's north-side suburbs has created new sewerage problems. The construction of new sewers is going on continually.

A sewer consisting of about 3,000 ft. of reinforced-concrete pipe, manufactured and furnished by the Independent Concrete Pipe Company of Indianapolis was built recently at Niles, Ill. The pipe used varied in size from 33 in. to 42 in. Alex Ranieri contractor of Chicago, handled the excavating and the laying of the concrete pipe and the work was carried on under the direction of Consoer, Older & Quinlan, engineers, of Chicago. The concrete pipe was cast in a special yard adjacent to the sewer and was then distributed along the line of work.

A crane mounted on crawlers handled the pipe sections, and a traction ditcher dug the trench. The pipe-laying crew was able to follow the excavator closely as is clearly shown in the lower photograph. Only a short length of trench was kept open at any one time.

The excavator, with the pipe-laying crew pressing it closely may be seen in the upper photograph. The trench was dug only a few inches wider than the pipe which meant a substantial saving in excavating costs, especially where rock or other hard digging conditions were encountered. It was possible to lay the pipe units properly and speedily in the narrow trench, because the lower half of each pipe joint was sealed inside the sewer. The upper half of each joint was sealed outside the sewer. All joints were thus readily accessible for sealing and inspection, in spite of the narrowness of the trench. This of course greatly increased the speed and ease with which the work was done.

At right — A section of the concrete pipe in the trench with the Austin excavator only a few feet ahead



Below — The P&H crane at the left handled all of the concrete pipe and kept up to the ditcher

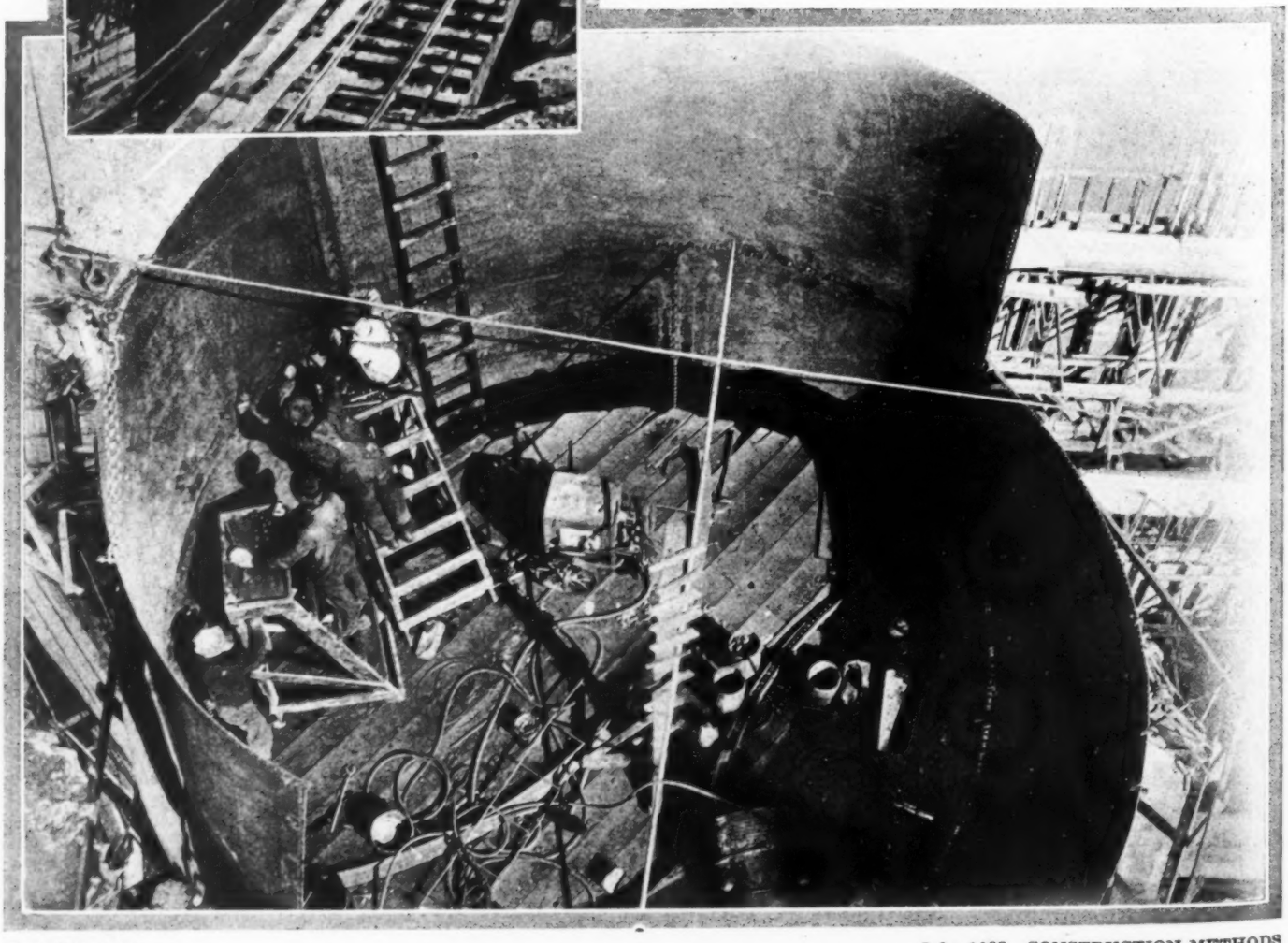
Anthony Bous

Structural Steel Foreman, The Utah Construction Co.,

Guernsey, Wyoming

Wins First Prize of $25.00

AN UNUSUAL method of building a steel surge tank wins first prize in the July contest. In building this surge tank at the Guernsey Dam at Guernsey, Wyo., F. T. Crowe, superintendent for the Utah Construction Co., adopted the unusual method of constructing a raft of railroad ties planked over in the bottom of the tank. As the sides of the tank rose, more water was pumped in so that the raft was always close to the top where the men could work. The upper photograph shows the tank nearing completion, and the lower photograph shows the men at work on the raft inside the tank. The outer scaffold consists of eight segments fastened together and supported by eight sets of tackle, but so arranged that if seven of the tackles broke and only one remained, the scaffold would still hold up. It was a safety-first job.



Prizes for Photographs

THE man with the camera is a useful person on every construction job. He can make records of various stages of the work and sometimes proves invaluable when disputes arise later on.

IN ORDER to encourage the taking of more photographs in the construction field *Construction Methods* is continuing its policy of offering three prizes for such photographs. The conditions are stated herewith:

THE photographs must be taken by a man actually employed on the job and should be sent to *Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Monday, July 11, and plainly marked Photographic Contest. Photographs received after that date will be entered in the September contest. *Construction Methods* will pay for all non-prize-winning photographs which it uses.

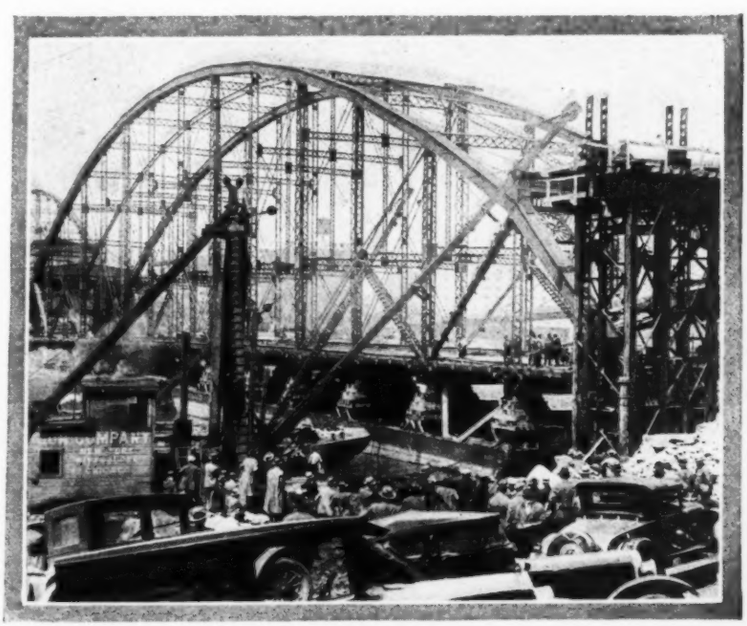
If you have a Camera

and are engaged in Construction Work

Send in your entry !

M. M. Mecklem
Draughtsman, Duquesne Light Co.
Rochester, Pa.

Wins Second Prize of $15.00



The south span of the Sixth Street Bridge at Pittsburgh after it had been lowered and placed on pontoons ready for floating down stream. The Foundation Co. is handling this work.

System Means Speed

Careful Planning Produces Rapid Progress in Construction of Elevator in Central Illinois

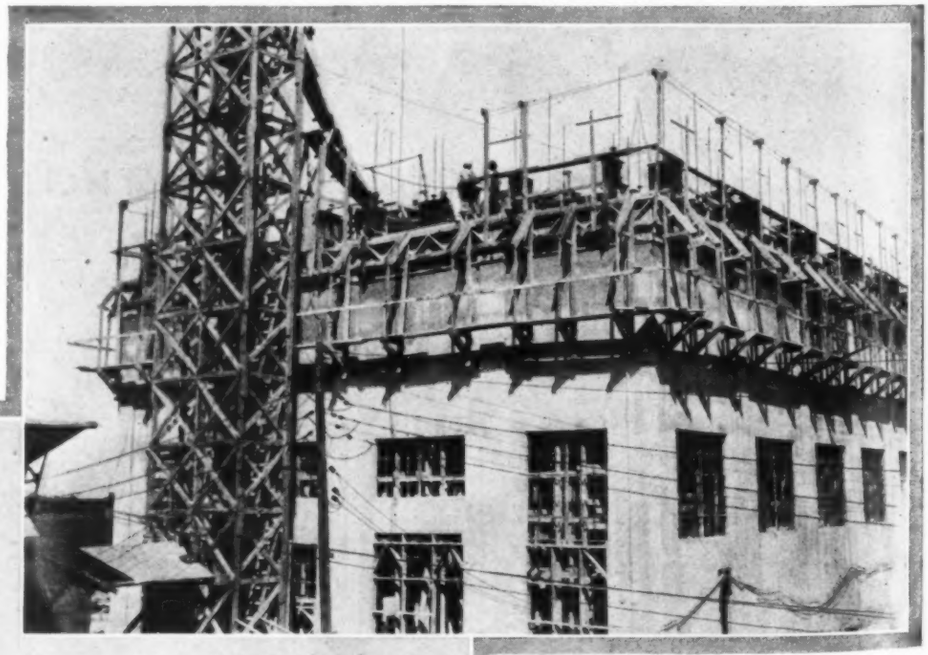
ERECTING a 3,000,000 bushel grain elevator in six months has all the earmarks of what the veteran building man would call a large contract. But this contract was put through for the A. E. Staley Co. at Decatur, Ill., by the Folwell-Ahlskog Co., which also designed the structures. The job included a workhouse, 63 ft. by 82 ft. and 229 ft. high; an annex, 120 ft. by 288 ft. and 140 ft. high; a drier building, 48 ft. by 60 ft. and 129 ft. high; a bleacher, 30 ft. by 50 ft. and 129 ft. high, and a dust house, 40 ft. by 80 ft. and 50 ft. high. The buildings are reinforced concrete. Their construction required the pouring of 32,000 cu.yd. of concrete and the placing of 1,200 tons of reinforcing steel. The foundations are on hardpan.

Systematized methods made this rapid construction possible. Everything to be used on the job was ready and waiting before it was needed. Forms on jack rods made continuous pouring possible, and buildings the size of the work house or drier building progressed heavenward at the rate of 7 or 8 ft. a day. The forms were 4 ft. in height. Two 1-yd. mixers, with towers and batcher plants, kept the hoppers filled with concrete.

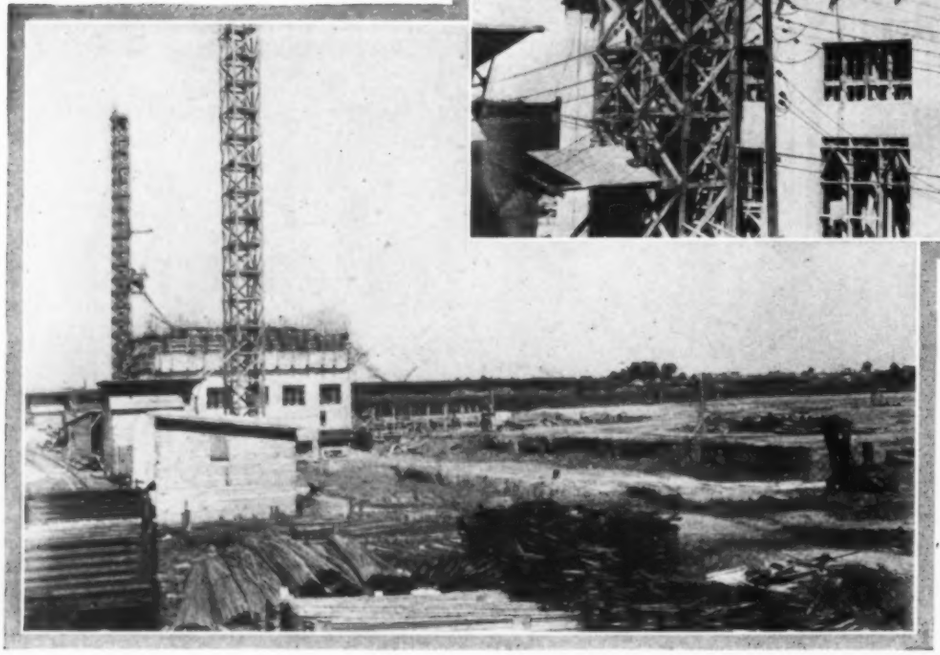
Two sawmills aided in the erection of the buildings. A stationary sawmill cut the sections for the forms, which were built on the adjacent floor and stored in advance of the demand for them. A portable mill on the deck of the building under construction made additional fittings quickly. All of the machines used by the Folwell-Ahlskog Co. with the exception of the cranes were electrically operated.

The 130,000 cu.yd. of excavation for the buildings were removed by Weston & Cahill of Decatur with an Erie steam shovel and two Western elevating graders. The same contractors did 250,000 cu.yd. of yard grading for the tracks to be laid in conjunction with the elevator.

The photographs on this page show the elevator buildings under construction. The general view shows both towers and the close-up picture shows the pouring of concrete under way. Another view of the pouring of concrete appears at the bottom of page 17. The jack rods used in raising the forms may be seen plainly in this photograph. The upper pictures on the opposite page show the grading operations which were handled by Weston & Cahill. C. E. Weston is the man standing in the background of the lower photograph in which a Western elevating grader hauled by a Caterpillar tractor is doing the grading. The superintendent in



At right — The workhouse had reached a height of 35 ft. when this photograph was taken. It gives a good idea of how the concrete was handled, tower, chute and concrete carts being used

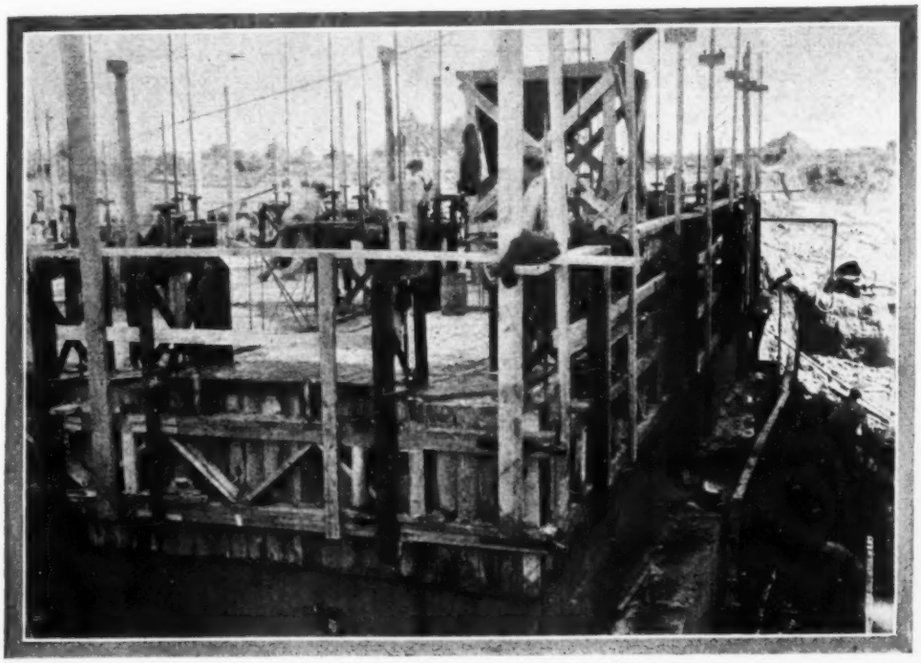


At left — Workhouse and drier building under construction with the excavation for annex at right. Some of the material to be used on the job may be seen in the foreground all ready for the construction gang

This Erie shovel handled the excavations for the foundations, work which was done under separate contract

Grading for the railroad yard which is necessary to take care of the elevator's needs. C. E. Weston of the firm of Weston & Cahill is shown in this photograph, watching one of his grading outfits at work. The elevating grader handled this job without difficulty

charge of the job for the Folwell-Ahlskog Co. is J. A. Visintine, and it is largely due to his handling of the job that such rapid and orderly progress was made from start to finish. He kept both men and machines busy except when the weather made it impossible to work and saw to it that the materials needed for the construction of the buildings were on hand when called for. He has proved that system means speed.



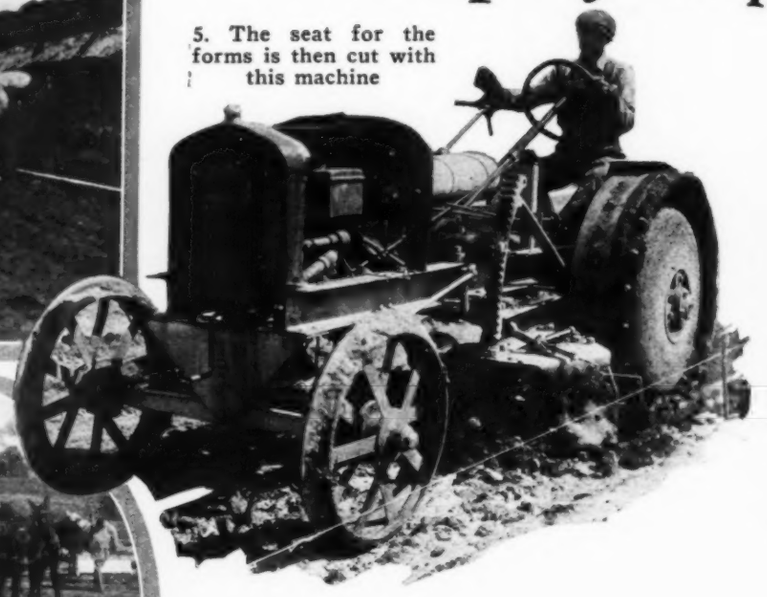
While the pouring of concrete was under way on the drier building

The forms and jack rods may be clearly seen in the picture

Step-by-Step

1. Not so long ago subgrading was done by main strength and awkwardness

2. Now a blade cuts down the high spots and the fresno stands ready to fill up the low places



5. The seat for the forms is then cut with this machine

Preparing the Subgrade for Concrete Pavement

3. A good scarifier hauled by a tractor breaks up the concrete to a depth of 4 or 5 in.

4. The tractor then takes the blade grader and cuts out for the thickened edge and roughly shapes the crown

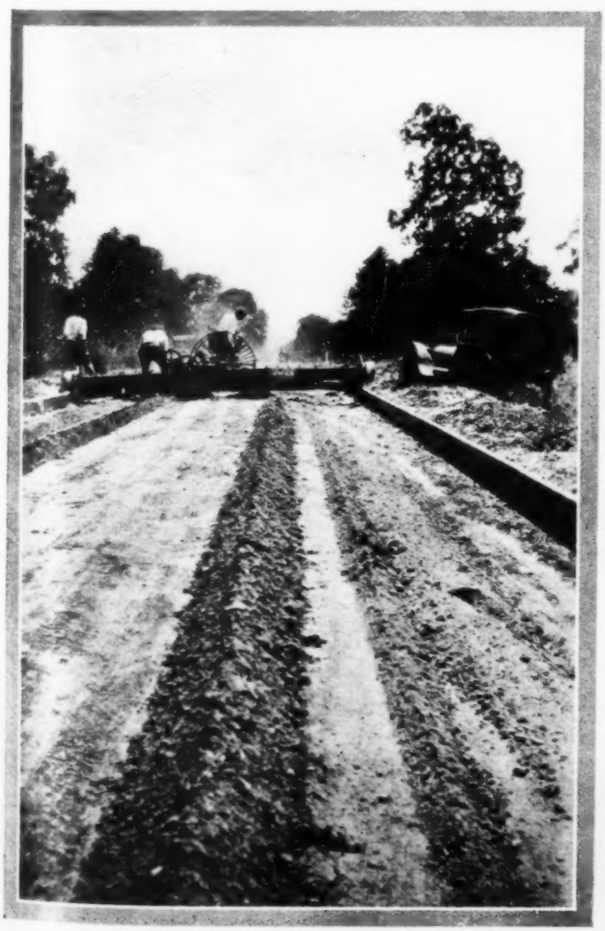
6. Steel forms are set by hand and then brought to grade and alignment

Field Methods

7. The subgrader is pulled back and forth two or three times by the tractor to reduce the subgrade to the proper crown

9. The fresnos come back on the job and clean up the windrows

Photographs by J. L. Harrison, Highway Engineer



8. Excess material is left in windrows by the subgrader

10. After the subgrade is rolled the forms are carefully rechecked

11. One more trip of the subgrader leaves the finished subgrade ready for the mixer

Confidence

BOOTH & FLINN, LIMITED
461 EIGHTH AVE.. NEW YORK CITY
CONTRACTORS

May 4, 1927

Ransome Concrete Machinery Co.,
Dunellen, N. J.

Gentlemen:—

We are pleased to advise that we have been users of Ransome equipment for many years.

We used your 28-S Mixers on two of the largest vehicular tunnels in America, namely the Holland Tunnels connecting New York City, N. Y., and Jersey City, N. J., under the North River, and the Liberty Tunnels in Pittsburgh, Pa., through Mt. Washington.

This, of itself, shows we have great confidence in your equipment.

Very truly yours,
BOOTH & FLINN, LIMITED
(signed) S. M. Rutledge
Assistant Treasurer.

No. 2 of a Series expressing "Confidence" by users of Ransome concrete machinery.

6-13-25

OTHER prominent contractors have shown "great confidence" in Ransome Mixers—Ulen & Co., used *six* Ransome 28-S Standard Building Mixers on the Shandaken Tunnel, N. Y.

Dwight P. Robinson used *thirteen* Ransome 28-S Standard Building Mixers on the Brazilian Irrigation Project—thousands of miles away from factory service.

The Ontario Hydro Electro Commission used *twenty-five* Ransome 28-S Standard Building Mixers on the Queenston-Chippewa Power Development.

Write for a bulletin

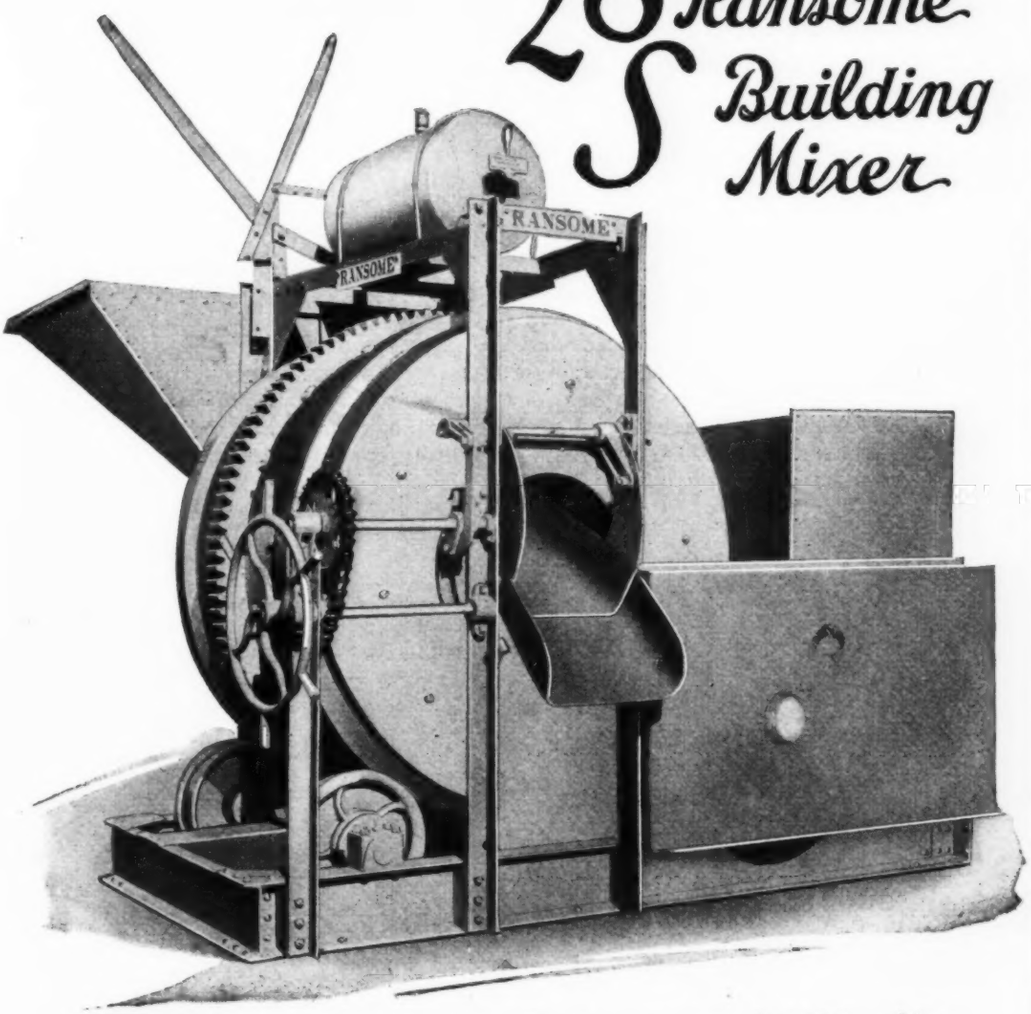
Ransome Concrete Machinery Co.

1850—SERVICE FOR 77 YEARS—1927

DUNELLEN NEW JERSEY

Confidence

28-S Ransome Building Mixer



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North State Culvert & Machinery Co.
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Prescott Machinery Co.
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Henry G. Williams
B. F. Avery
BALTIMORE, MD.
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BIRMINGHAM, ALA.
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The Wheeler-Murray Co.
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Western Supply Co.
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J. C. Neely & Co.
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Clarksburg Supply & Equipment Co.
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Ransome Concrete Machinery Co.
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E. F. Pegg Co.
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Construction Equipment Co.
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J. W. Bartholow Co.
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ROCKFORD, ILL.
Swords Bros. Co.
SAN ANTONIO, TEX.
Brandt Iron Works
SEATTLE, WASH.
Star Machinery Co.
SPOKANE, WASH.
Hallidie Co.
ST. LOUIS, MO.
Lincoln Equipment & Materials Co.
SYRACUSE, N. Y.
The Wheeler-Murray Co.
TOLEDO, OHIO
National Supply Co.
TORONTO, ONTARIO
Clare Osborn, Ltd.
VANCOUVER, B. C.
B. C. Equipment Co.

THE Turner Construction Company poured 1100 cubic yards in 7 hours and 45 minutes with two 28-S Ransomes.

Clifford F. MacEvoy Co. with one 28-S Ransome poured 768 cubic yards in 9 hours and 50 minutes, Center Market, Newark, N. J.

The Watson Co. maintained a continuous output of 45 batches per hour with a full minute mix.

RANSOME

Who Can Beat Record of G

Tony Cross, Joe Granger and John Hinehan Can Lay 425 Feet of Stone Base in One Week

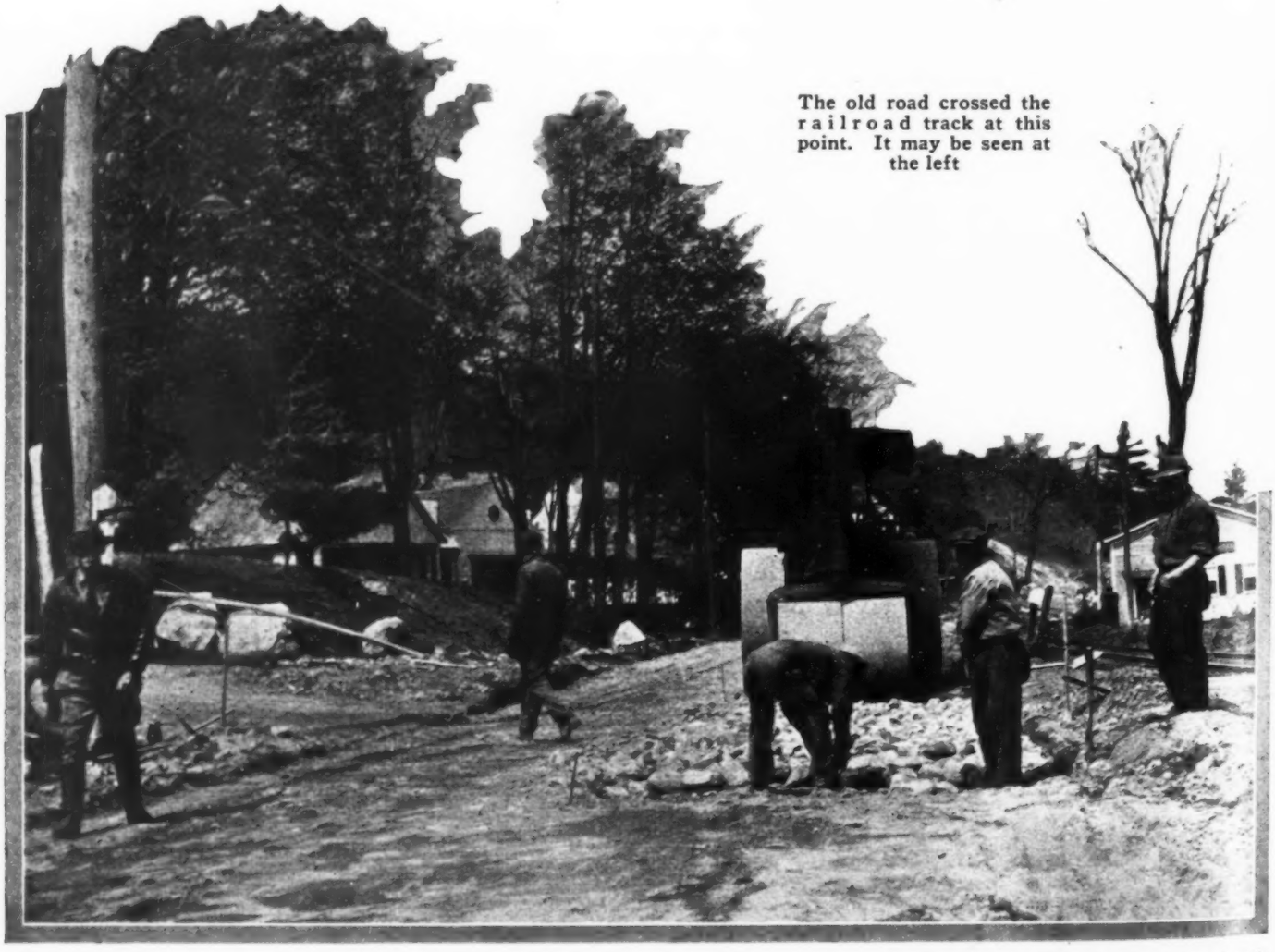
THREE men, who, according to their boss, deserve wider recognition for their skill, are laying stone on a New Hampshire highway this summer. They have been working together for a number of years and Frank P. Mosher, superintendent for Ralph E. Bull, their employer, says that he would like to hear from any construction organization that can boast a better team.

The three, who are shown in the upper photograph on the opposite page, with Mr. Mosher, marshalling them before the camera, are Tony Cross, Joe Granger and John Hinehan. They have proved on more than one occasion that they can lay 425 ft. of stone base 18 ft. wide and 8 in. deep in a week and the lower photograph shows them hard at it.

The job on which they are now working is on the Contoocook Valley Road just outside of Peterboro. It is a penetration job and was begun last fall when most of the grading was finished and a good deal of the base was put in. The road has been relocated so that two railroad grade crossings have been eliminated in less than one mile. One of them formerly was at the point shown in the picture at the bottom of this page. This is a typical example of the kind of road which the New Hampshire Highway Department is building in various sections of the state. New Hampshire fills up with tourists every summer who demand good roads—and get them.

Ralph E. Bull, who makes his headquarters at Fitchburg, Mass., has been doing highway work in New Hampshire for a long time. At present he has several other jobs under way in different parts of the state. Superintendent Mosher has been with the organization for several years and has built many miles of road. He says that he has never had a crew that could lay stone as well as Tony, Joe and John and wants them entered for any laurels that may be distributed.

Under the direction of Frederic E. Everett, the New Hampshire road system has been undergoing a process of steady development for a number of years. At the present time a number of jobs of the character of this one are under way. Many railroad crossings also are being eliminated.



The old road crossed the railroad track at this point. It may be seen at the left

Granite State Trio?

From left to right—Frank Mosher, superintendent; Tony Cross, Joe Granger and John Hinehan, stone-laying crew. It takes them only a few minutes to polish off a truck load of stone

August Photographic Contest

Three Prizes for Photographs of Construction Work

First Prize $25.00—Second Prize $15.00—Third Prize $10.00

Entries close Monday, July 11

More Water for Dallas

Garza Reservoir Now Nearing Completion Will Increase Texas City's Supply

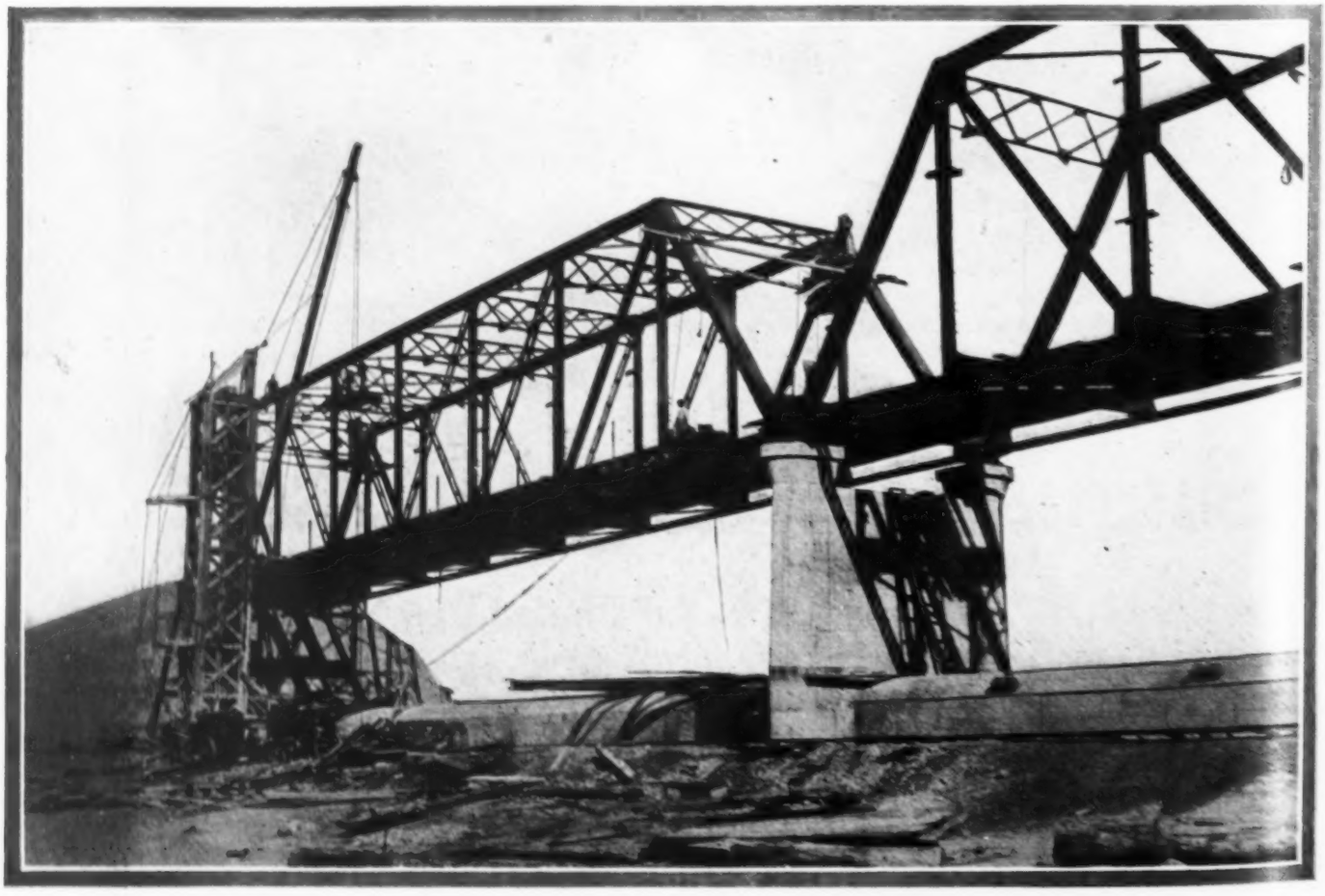
THE Garza Reservoir, which is now nearing completion, will increase the water supply of Dallas, Texas, to provide for a future population of 770,000. The hydraulic fill earth dam, 11,000 ft. long, which was begun about three years ago, will store 194,000 acre-ft., covering 11,000 acres of land at spillway level. It is situated on the Elm Fork of the Trinity River, about 26 miles northwest of Dallas.

The length of the section of the dam crossing the main valley is 3,500 ft. The top of the dam is 80 ft. above river bed and 15 ft. above the spillway crest. A 30-ft. gravelled roadway occupies the top of the dam. The maximum thickness at the base is 533 ft. The upstream face is protected by limestone riprap, 18 in. and 12 in. thick, hand placed on an 8-in. gravel blanket.

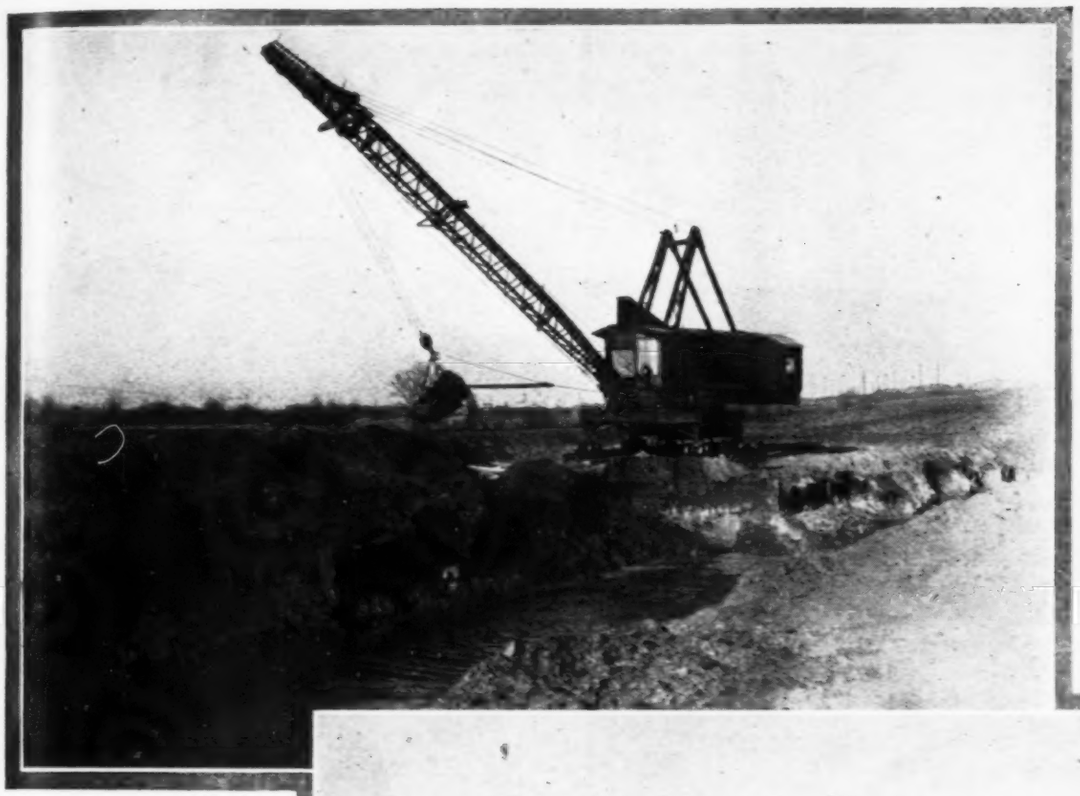
The spillway is an Ogee type concrete weir, 560 ft. long, with the crest 65 ft. above river bed. A concrete slab 4 ft. thick connects this section with the apron 65 ft. below the crest. The slope of this slab changes from 2 to 1 at the top to 1¼ to 1 at the apron. Four steel truss spans, 139 ft. long, carry the roadway across the spillway.

Two conduits were constructed near one end of the spillway. These are reinforced concrete-arched barrels, 14 ft. by 19 ft. in section and 312 ft. long. Flow through the conduits has been controlled by means of stop logs during construction. The permanent outlets are to be four 48-in. gate valves, concreted into the conduits.

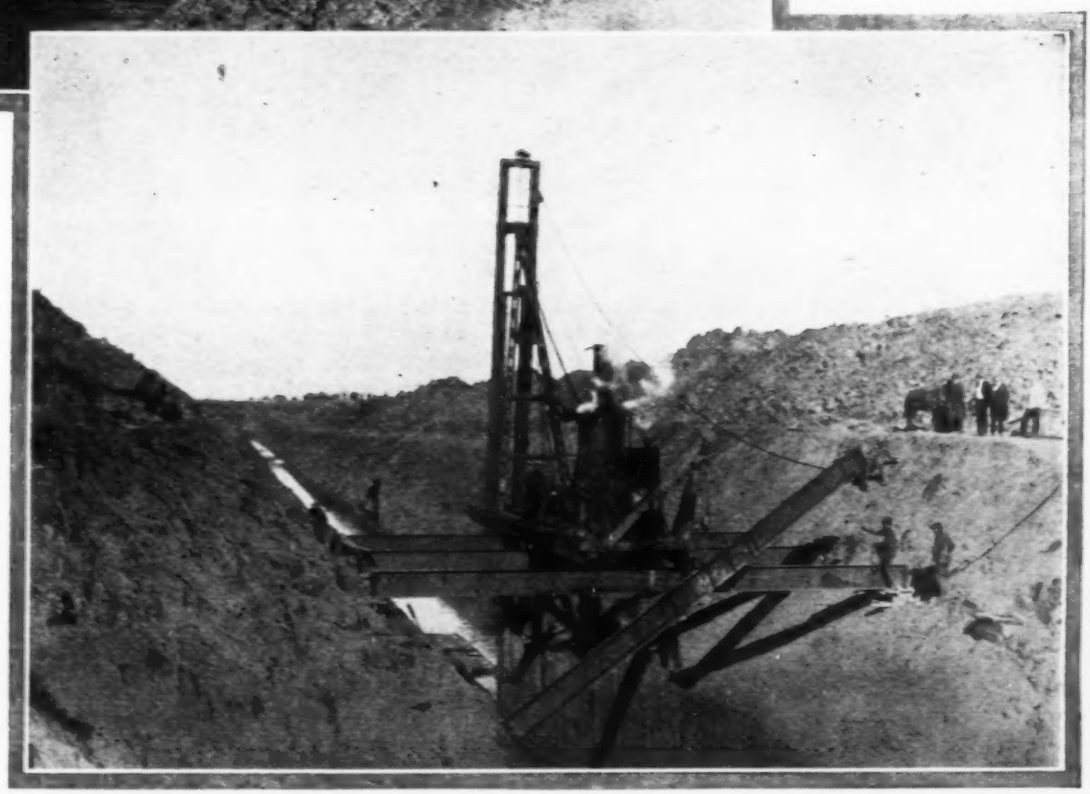
Construction was begun in the fall of 1924. A spur railroad, two miles in length, was built connecting with the M.K.T. Wichita Falls branch, and a power substation was



Traveling tower setting steel on bridge across spillway



This Bucyrus dragline excavated core tranch of dam



I-beams were used to support piledriver over core trench

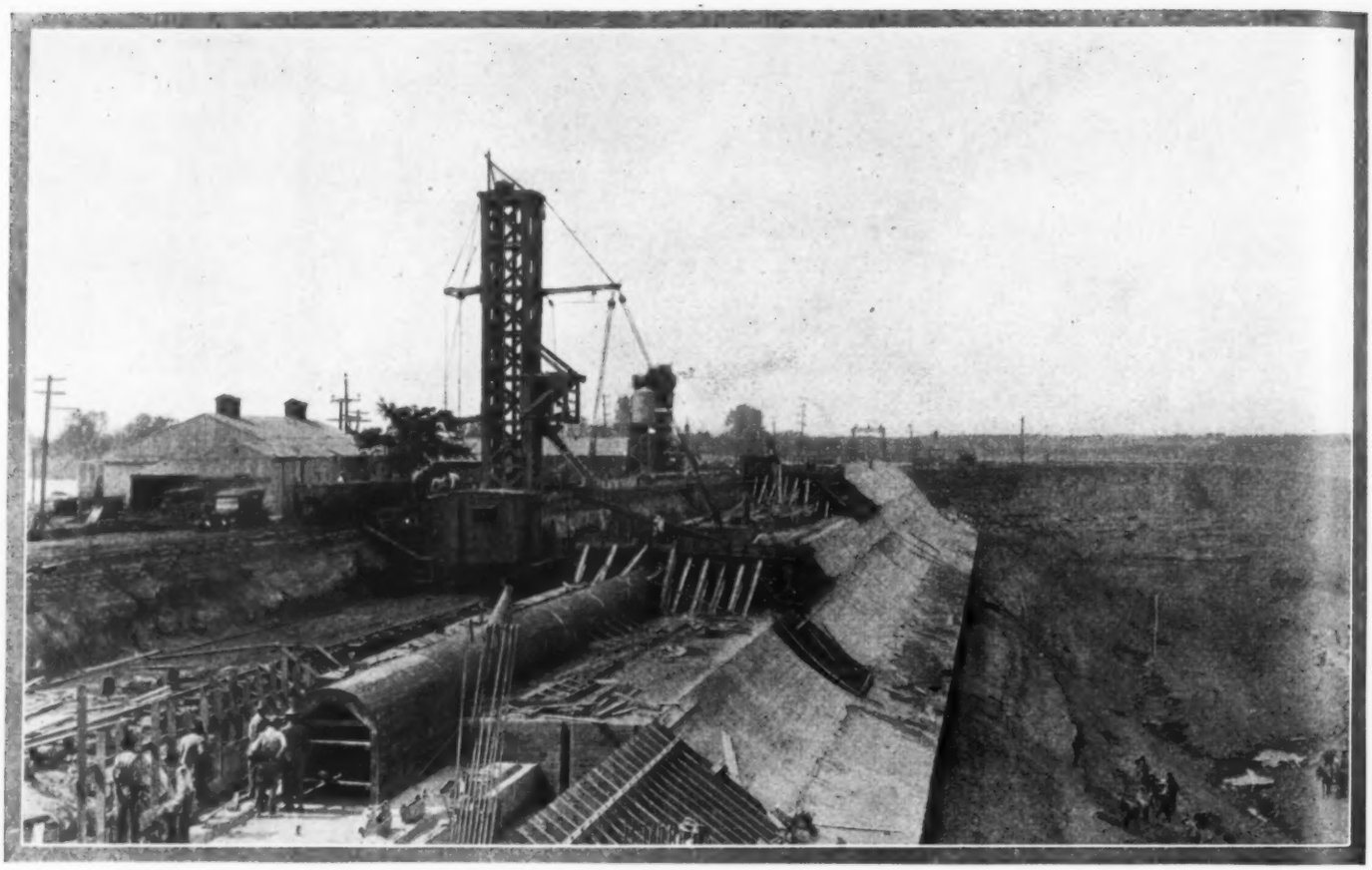
installed at the site of the dam to transform 60,000-volt current to 2,300 volts. Excavation for the spillway and conduits was begun at once, and an electric dragline with a 5-cu.yd. bucket began digging the core trench. This trench was carried down to shale on all parts of the dam except in the river valley. Here excavation was made to ground water level, and interlocking steel sheet piling was driven to the shale.

A 24-in. suction dredge, powered with a 1,600-hp. induction motor, was built and launched during the winter of 1924-25. It has obtained all material from borrow pits immediately above the dam.

A concrete mixing plant was erected near the site of the spillway and conduits. Gravel pits were opened above the dam where two gas shovels were put to work loading 1-cu.yd. trucks. There was a haul of about 1½ miles from the pits to the storage pile near the mixing plant. The trucks were able to make this trip as long as the dredge was filling the south end of the dam. By the time the dredge broke through their roadway on its way to the north side of the dam, they had built up the storage pile to 55,000 cu.yd. The trucks were then rerouted to deliver gravel for the blanket on the south end and to build a storage pile below the dam on that side.

Gravel was reclaimed from the storage pile with two elevating loaders and was hauled to the mixing plant, where it was lifted by bucket conveyors and was screened before entering the bins above the mixer. Traveling concrete-placing plants were used on both spillway and conduits. Gas locomotives hauled the concrete from the mixer to the placing plants in V-type dump cars on 24-in. gage track.

Concrete for the conduits was spouted from the receiving hopper through a 40-ft. boom chute. A tower and hoist



Pouring spillway weir while excavation is still going on below. Movable tower and hopper provided the concrete

were used on the spillway placing plant to elevate the concrete before chuting it. A 2-drum hoist was mounted on the plant platform. One drum was used for moving the plant in one direction. A stump puller, previously employed for grubbing in the reservoir basin, provided power for moving the opposite way.

Excavation for the gravity section of the weir was completed before the foundation for the apron had been uncovered. Pouring was, therefore, started at the top of the spillway, and concrete was alternately delivered to the conduits and to the spillway, pouring going on at one place while forms were being moved at the other.

In pouring the 4-ft. slab connecting the apron with the gravity section, standard cantilever sectional forms were employed. The form sections were fastened to the poured slab with bolts screwed into nuts imbedded in the concrete, and the cantilevered ends were lashed at the correct distance by guy wires anchored in the slope. The traveling tower was used in pouring the slab, a large capacity chute on wheeled trucks carrying the concrete across the top poured section without spattering.

In the construction of the hydraulically filled dam embankment, two ¾-cu.yd. draglines were used to build the levees to hold the sluiced material in the successive layers. On the section where it was necessary to drive sheet piling in the core trench, the piledriver was supported on 24-in. I-beams. 40 ft. long, spanning the ditch. To move ahead, a small A-frame would be utilized to pick up the extra I-beam, which would then be carried ahead and placed with the hammer line. The operation is illustrated in one of the photographs on page 25. The method is simple and quick, and the use of I-beams proved to have many advantages over timber piling as a support for the piledriver, not the least of these being the salvage value of the steel.

The methods of handling the gravel were very successful. In building the main stock pile, the trucks began dumping on a slope. As the pile was extended out from the firm ground, plank runways in 4 and 8-ft. sections were laid on the soft material to carry the trucks. The side boards, or flanges, on the runways were bolted to the planks near the end of the sections. Catch links, dropped over the bolts of adjoining sections, kept the sections from separating.

Specifications required that the slope should not be cut by trucks dumping gravel for the blanket on the upstream face. A practical method for meeting this requirement was used on the south end of the dam. The roadway was always gravelled some distance ahead of the points at which blanket gravel was being placed. There were two points for dumping blanket gravel. Timber mats were placed at each of these to aid the trucks in turning, as the loose gravel in the roadway made this operation difficult. At each point, also, a cable attached to the winch of a small tractor was passed through a block anchored at the top of the downstream slope. Two chains connected to the loose end of the cable were hooked to the frame at the front of the truck. Dumping was started at the top of the slope, and each successive truck was lowered over gravel already deposited until a windrow had been formed to the bottom. The windrows were spaced at intervals to give the required 8-in. thickness to the blanket when the gravel was smoothed with fresnos pulled up the embankment by cable. There were thus three places, the roadway and two windrows, at which gravel could be dumped, and trucks were never kept waiting for a place to unload.

The traveling tower at the spillway was adapted also for use in erecting the bridge steel. For this purpose, a 12x12-in. post was set in one corner of the tower, and diagonal braces were placed inside the wood structure to resist torsion. The heel block for a wood boom was bolted to the post, and the boom handled the steel.

After the south end of the dam had been gravelled, the

standard-gage track was moved to the roadway. The limestone for riprap was brought in on this track and was chuted to convenient piles on the upstream slope. Because the spillway bridge will not carry loaded standard-gage cars, it is necessary to transfer the stone to 24-in. gage 1½ cu.yd. dump cars to transport it to the north end of the dam.

The W. E. Callahan Construction Co., Dallas, Texas, is general contractor for the Garza Reservoir. E. S. Heyser, vice-president, is in active charge of operations. H. F. McFarland, general superintendent, has had as assistant superintendents, S. E. McCullough, John Helmer, and Dallas Vance. A sub-contract for the hydraulic fill was taken by the Puget Sound Bridge & Dredging Co. J. G. Greeley is superintendent for this firm.

The consulting engineers for the project are J. C. Nagle and R. A. Thompson. These men investigated seventeen possible sites before making a selection. They have been assisted by O. N. Floyd, in charge of field work, and J. L. Lochridge, office engineer in charge of design. T. C. Schuler is resident engineer.

Wire Ties for Concrete Forms

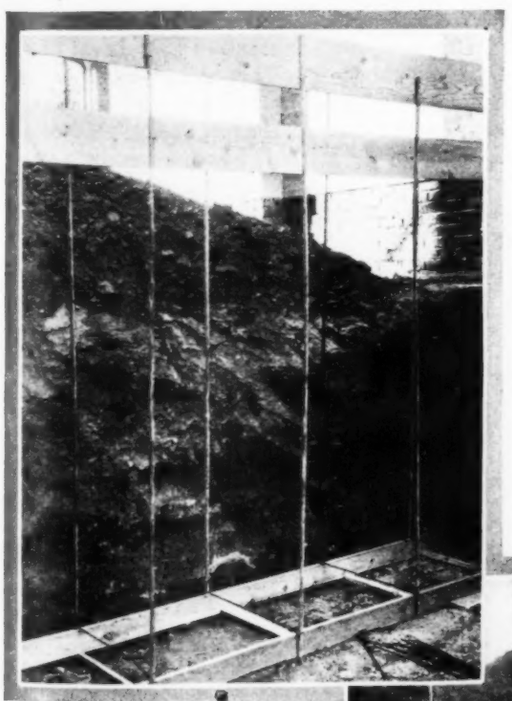
A SMALL job in Denver recently attracted much attention from the building contractors of the city because it demonstrated the use of a new form of twisted wire ties for concrete forms. The photographs indicate the method of erecting forms with these ties.

The ties are of machine twisted wire, fashioned exactly to length to fit any width of form. They are looped at the end to allow insertion of a ⅝-in. steel rod which takes the place of the old timber post. As the photographs show, a 12-penny cut nail is dropped through the eye of the loop inside the forms. The rods and nails hold the forms secure at all heights, and the wires are stiff enough to make the use of spreaders unnecessary.

The rods are rented to the contractor at a low cost, 3 cents apiece in this case, for as long a time as he needs them. The rods are made in different lengths up to a maximum of 7 ft. 3 in. Forms may be carried to any height, however, as ties with two loops are made especially to permit splicing of the rods.

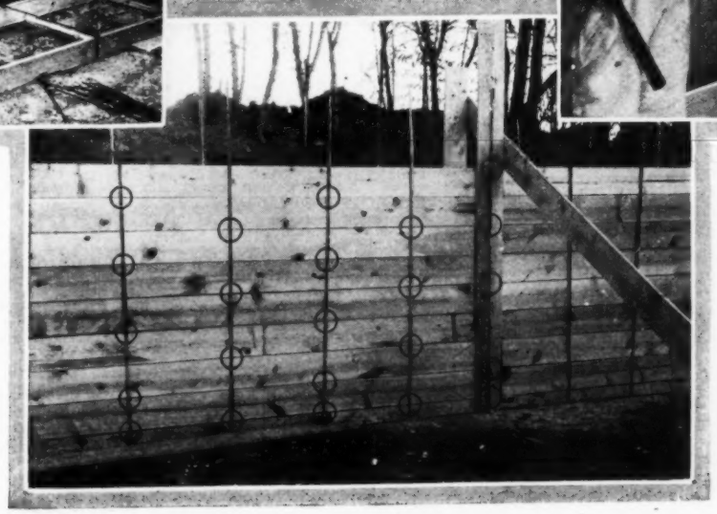
The wire ties mean a great saving in lumber. Practically nothing is lost in stripping the forms. Furthermore, the forms are self-aligning, and they can be erected in much shorter time than by the old method. No more time is required to construct forms 30 in. wide with wire ties than to erect forms 8 in. wide by the same method. The wires cannot cut into the rods as they can into wood uprights, and there is no danger of a bulge or break resulting from concussion or pressure of the concrete. Whalers are unnecessary.

E. N. Miller of Casper, Wyoming, is inventor and patentee of the twisted wire ties, which are manufactured by the Concrete Form Security Co. of Denver.



Above — The first step in the erection of the forms. Steel rods in place

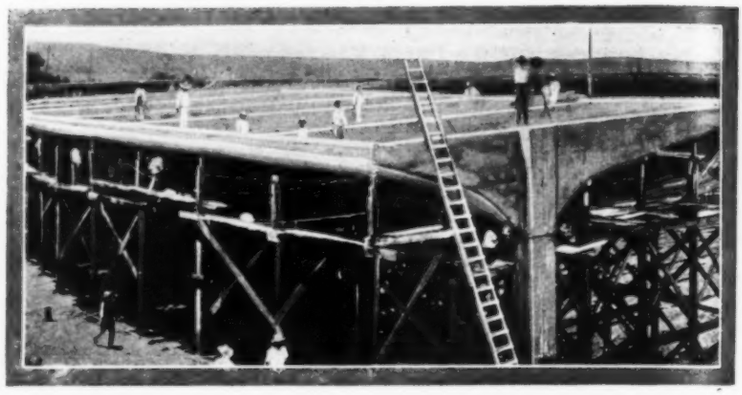
Below — Wall form held in place by wire ties. Not a nail is in sight. The picture is marked to show method of staggering the wire ties



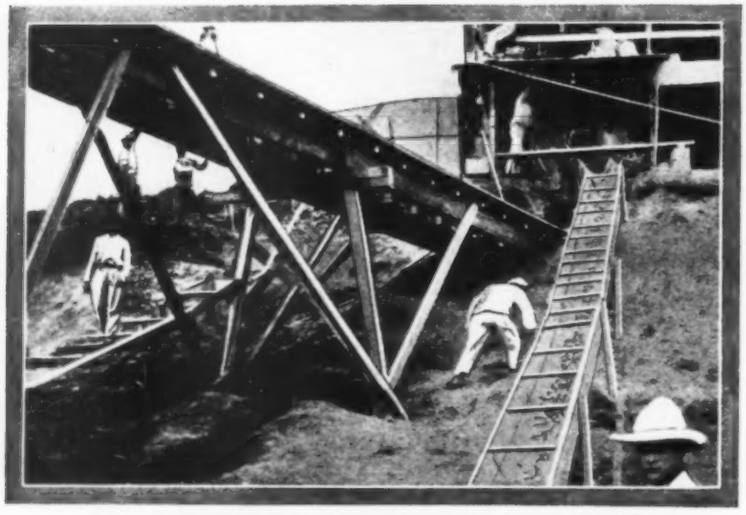
Above—Building up the forms is a simple operation

A Mexican Stadium

Concrete Structure at Jalapa, the Capital of State of Vera Cruz, Built in Three Months



A section of the concrete roof showing one of the single line of columns

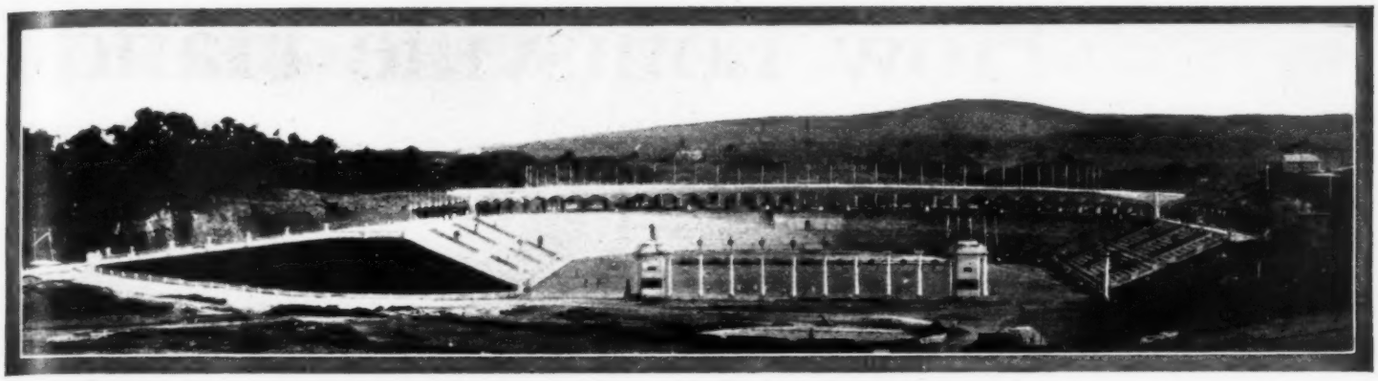


The mixer which furnished concrete for two levels

A CONCRETE stadium was built recently at Jalapa, the capital of the state of Vera Cruz, Mexico. The entire structure is shaped like a horseshoe, consisting of two straight uncovered stands, each 246 ft. long, joined by a curved covered stand. It was built in three months.

The site selected for the stadium was in a valley surrounded by hills, and the first job which confronted the builders was to provide adequate drainage. A concrete tunnel was built through a hill at the rear of the stadium opening into another valley lower down. Drains were constructed flowing into this tunnel and extending to every part of the site. The roof of the covered portion of the stadium is supported by a single

The stadium under construction. The roof was poured from the curved bridge at the right



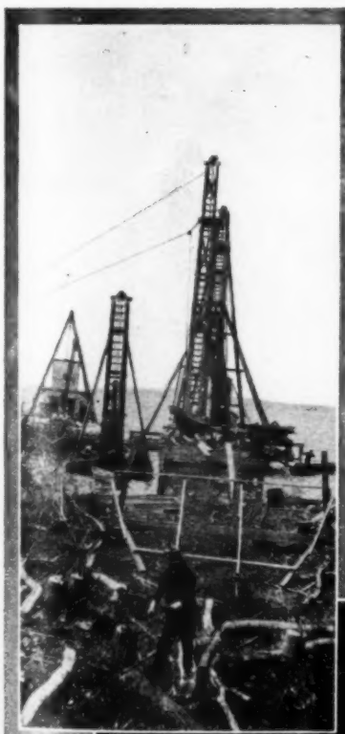
The finished structure ready for the official opening

line of columns. This roof extends in the rear far enough to shelter a passageway around the back of the structure and in front to cover about half the seats in the curved section.

The concrete plant was set up on a hill above the level of the stadium and concrete was poured into carts on two levels. The lower level carts carried the mixed concrete to the tiers of seats, and the upper level carts ran along a curved bridge from which the roof was poured. This bridge is shown at the left in the photograph at the bottom of the opposite page.

In order to finish the job in three months, work was carried on night and day, and at times as many as 1,300 men were on the job. The engineer in charge of the work was Modesto C. Holland.

Driving Concrete Piles Under Difficulties



SHALLOW water, the fact that the approaches were still under construction and the necessity of bringing piles on barges from a town six miles away complicated the building of a bridge one and one-half miles long for the state of North Carolina near Edenton. The contractors, the Sanford & Brooks Construction Co. of Baltimore, Md., solved the problem by setting up falsework strong enough to carry a light stationary piledriver.

The piles were brought to the bridge on a large derrick scow and handled one by one over a pontoonway to a point where the stationary piledriver could pick them up and place them. This method of handling the piles has enabled the contractors to make excellent progress in the construction of the bridge.

Some of the difficulties of getting the barges carrying the heavy concrete piles to the site of the work may be seen below. At the left is the piledriver and at the right a typical example of its work

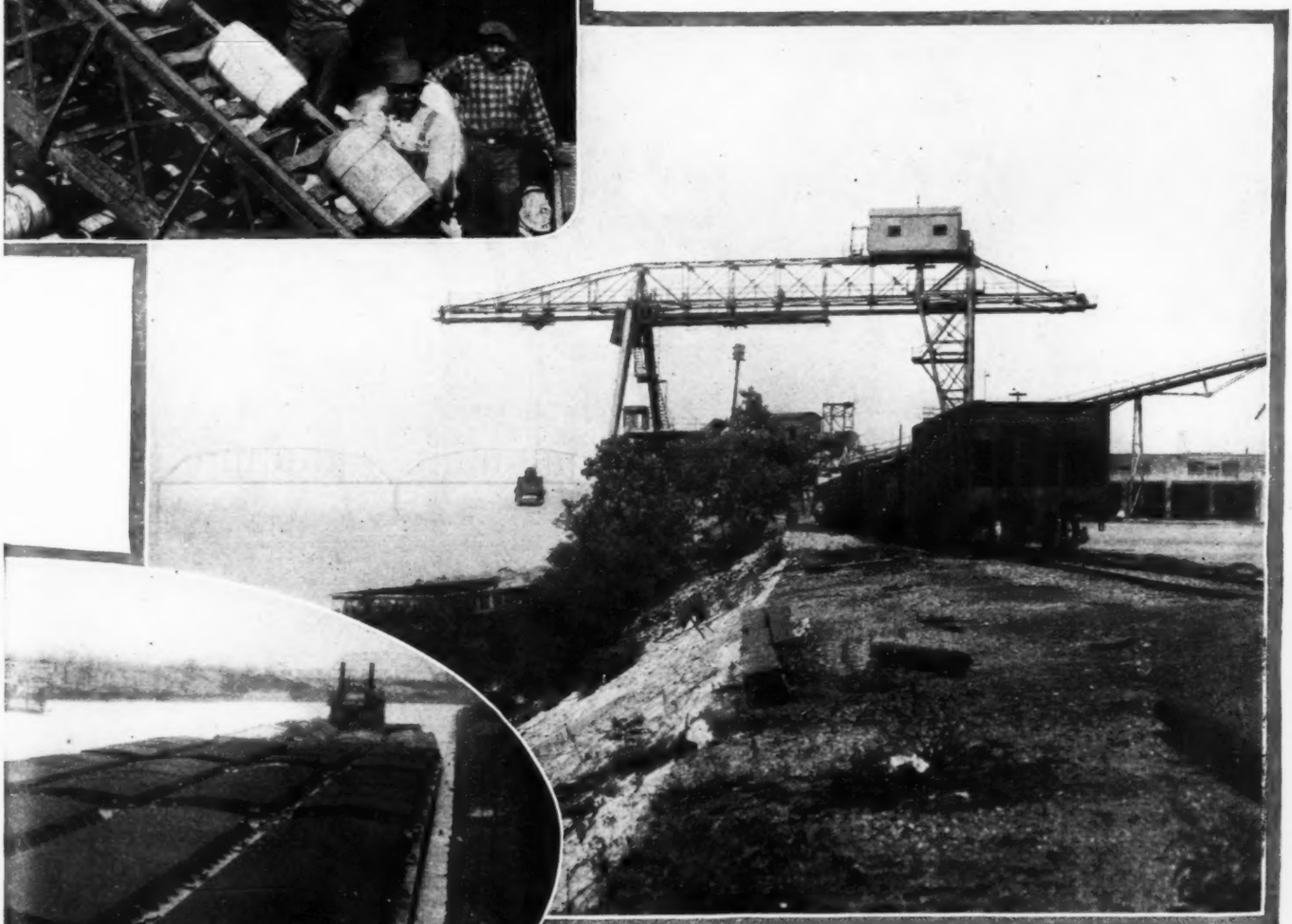
How Louisville Handles It

Louisville, Kentucky, which, according to the last Federal census, has a population of 234,891 and is the business center of a large territory, brings in most of its building materials by water. These four photographs show various methods used for unloading construction materials brought to Louisville in barges on the Ohio River. At the present time the locks and dams on the Ohio River are being enlarged and rebuilt so that future river traffic probably will be greatly increased. This is almost certain to mean the construction of river-rail terminals to take care of business such as that shown in these photographs which is now handled at various points along the river bank.

Derrick owned by the Louisville Gas & Electric Company transferring sand and gravel from barges to large hoppers built over railroad tracks. Cars can be filled very quickly from this setup. The photograph at the top of the page shows a conveyor owned by Inland Waterways Co. transferring kegs of nails from barge to car

Its Construction Materials

In the photographs shown on these pages some of the material is being transferred from barges to railroad cars for use in the territory outside of Louisville. In other cases the material unloaded will be transferred directly to trucks and used within the limits of the city. All four of these photographs were taken by Marshall Gray of the U. S. Engineer office of the War Department who is stationed at Louisville and who is a regular reader of *Construction Methods*. He sent in these pictures in the belief that Louisville's methods of handling construction materials would be of interest to other readers. Every big city in the country has its material handling problems.



Bridge crane owned by the Ohio River Sand Company picking up sand and gravel from barges and delivering it to railroad cars and trucks. The photograph at the bottom of the page shows some of the steel contained in these eighteen barges which will be used in Louisville. The rest will continue to points further down the river

Fast Pace Set by Southern C

Preparing the subgrade just ahead of the mixer

Cleaning up the material yard as the job nears its end. An Erie crane in the background

A well-equipped blacksmith shop helped to speed up the work

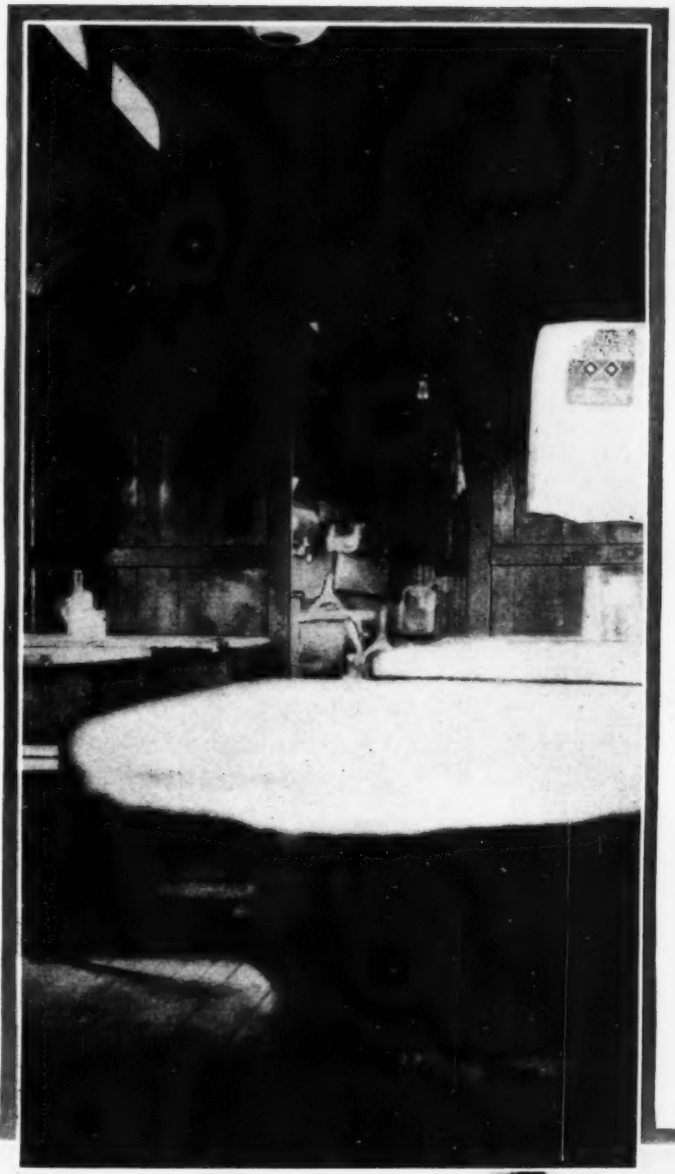
rn Contractors

Early Season Record Made on Concrete Road Job

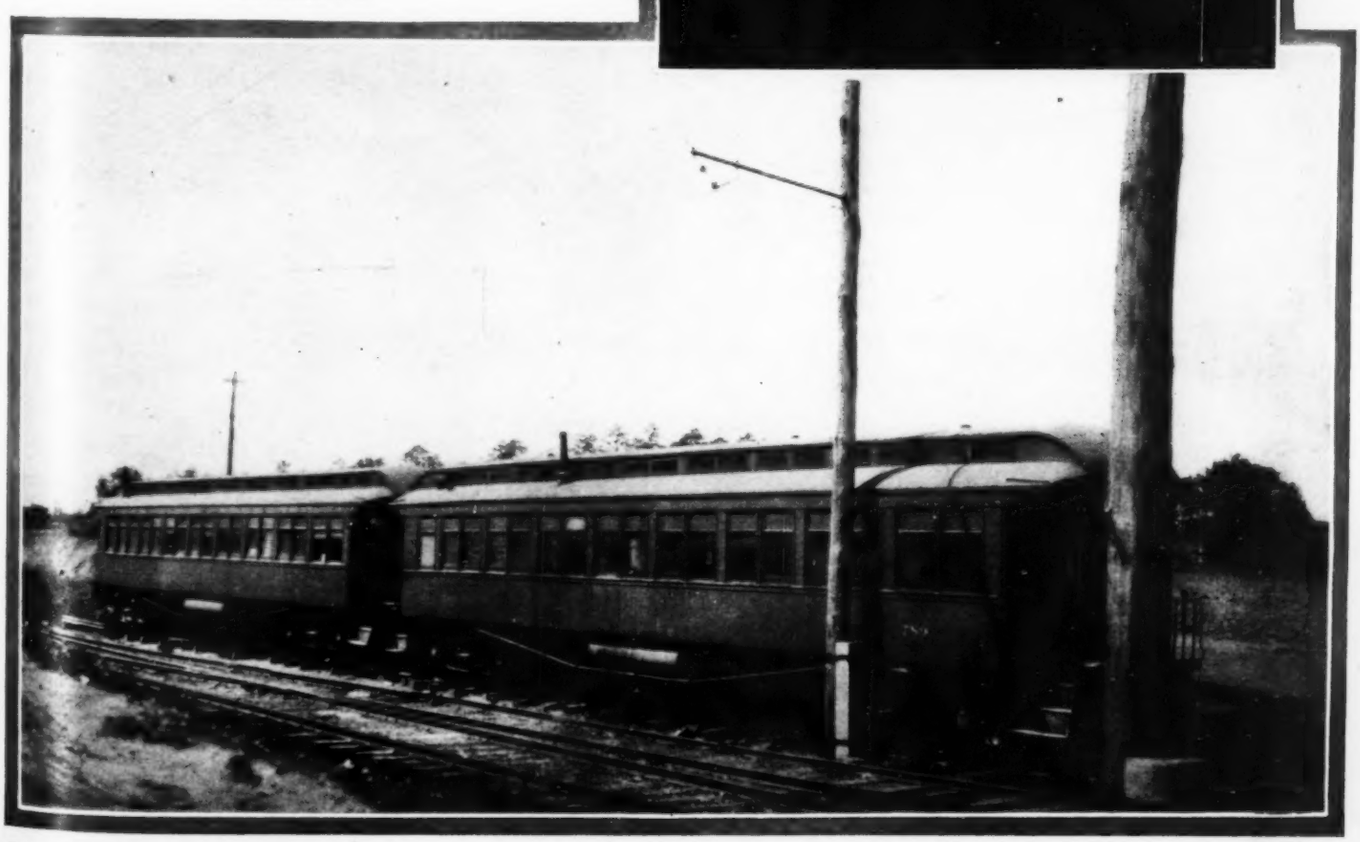
REMARKABLE performances in road building are getting on record early this year. The earliest comes from South Carolina where Pennell & Harley are building a concrete road for the state near Spartanburg. This road is 20 ft. wide and the slab is 8 in. at the edges and 6½ in. in the middle. In 18 consecutive working days the Pennell & Harley organization under the direction of J. B. Harley, superintendent, laid 16,212 lin.ft. of pavement. This would be an average of more than 1,000 ft. per day of 18-ft. pavement, and to keep up this record for 18 days is a considerable achievement.

A Foote 27-E mixer is handling the concrete and an Ord finishing machine also is on the job. Heltzel forms are used. Six White 2-batch trucks and six GMC 2-batch trucks supply the mixer from the material yard where Butler bins measure the batches. Most of the grading has been done with a Lakewood subgrader and a Buffalo-Springfield roller.

For the office and cook house two old railway passenger cars are used. These are moved by the railroad at 19 cents per mile each, so that when a job is finished it is possible to fill them up with small tools and other equipment and move to the new job at an extremely moderate cost.



These two railroad cars contain offices, dining room, kitchen and sleeping quarters for the cooks. A corner of the dining room is shown at the right



When Do We Eat?—*Modern Methods and*

LABOR turnover is an expensive item. Since wages remain fairly constant among different construction companies, workers gravitate where the best living conditions exist. Good food is the surest means of maintaining morale and stimulating production efficiency.

Experience gained in feeding construction men for more than 20 years has been capitalized in the specialized business of the Central Boarding & Supply Co., commissary contractor, of Kansas City, Mo. Through the courtesy of that organization, *Construction Methods* presents photographs showing various phases of the commissary contractor's service.

EXECUTIVE OFFICES (above) in Kansas City, Mo., of the Central Boarding & Supply Co.—Here negotiations are carried on with railroads, construction companies, and other large industries for the operation of camps of all descriptions.

GENERAL OFFICES (above) from which orders are placed for foodstuffs used in 75 camps, located between the Alleghenies and the Rockies, Chicago and the Gulf of Mexico. In this office contracts and purchases are made for food, tobacco, dry goods, notions, clothing and shoes. All the camps have commissaries where these articles are for sale—sometimes the nearest store is many miles away.

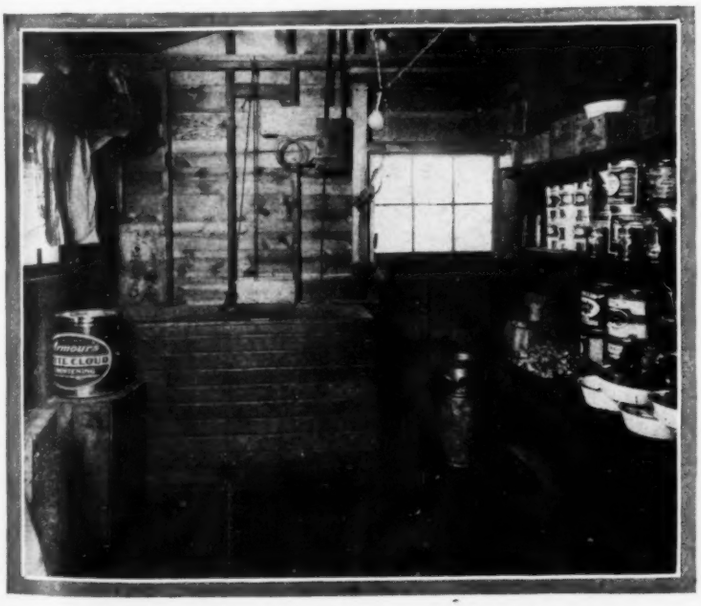
STOREROOM (above) for non-perishable supplies which are usually ordered twice monthly.

TRUCK (at left) leaving the central warehouse with a load of supplies for a freight terminal.

Equipment for Feeding Men on Construction Work

DINING ROOM of camp near Fort Collins, Colo. In addition to the operation of boarding camps the commissary contractor maintains free employment offices in several cities from which construction workers are sent out to the job.

HOTEL BUILDING at West Winfield, Penna., used for housing and feeding 200 men on construction of a large cement plant.



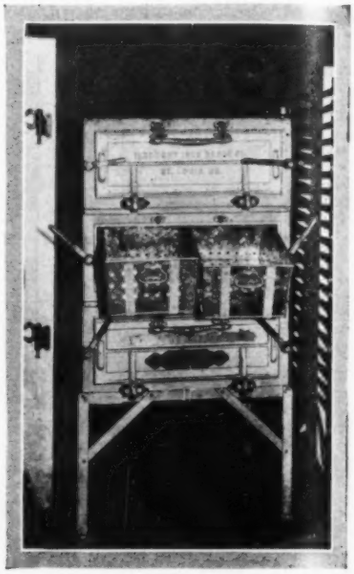
STOREROOM AND ICEBOX for moderate-sized camp. Non-perishable supplies stocked on shelves.

REFRIGERATOR in a large camp. The ice compartment is at the top, making the refrigerator about 9 ft. high.

Camp kitchen and equipment views on two following pages

Typical Job Kitchen Equipment and Provisions for

POTATO PEELER for large camp. Saves its cost every month in labor.

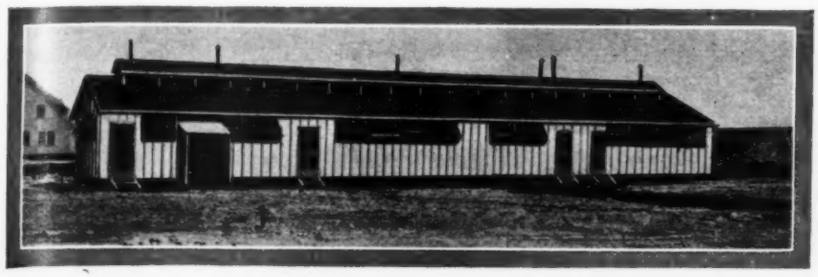


STEAM COOKER for large camp. Each basket holds a bushel.

ELECTRIC DISHWASHER (in oval, above). One vessel has scalding, soapy water and the other clear, hot water for rinsing—dishes do not have to be wiped. In a large camp this dishwasher will save its cost in soap alone in a 5-year period.

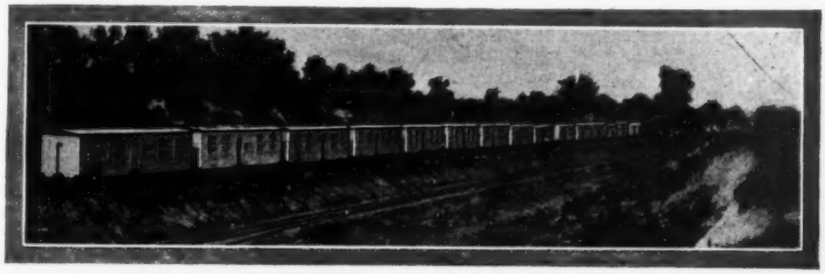
CAMP KITCHEN. Many years' experience has demonstrated this arrangement to be best in camp kitchens. This camp in foothills of the Rockies near Fort Collins, Colo.

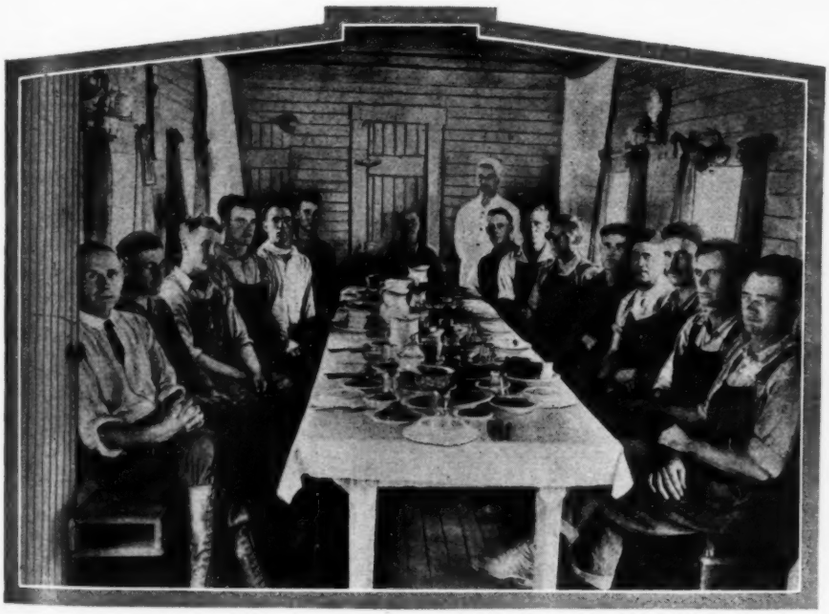
Housing Workers in Stationary and Mobile Camps



STATIONARY CAMP (at left). This building, 35x80 ft., will easily house kitchen, dining room, and storeroom for 120 men. Another building, half again as large, will provide sleeping quarters.

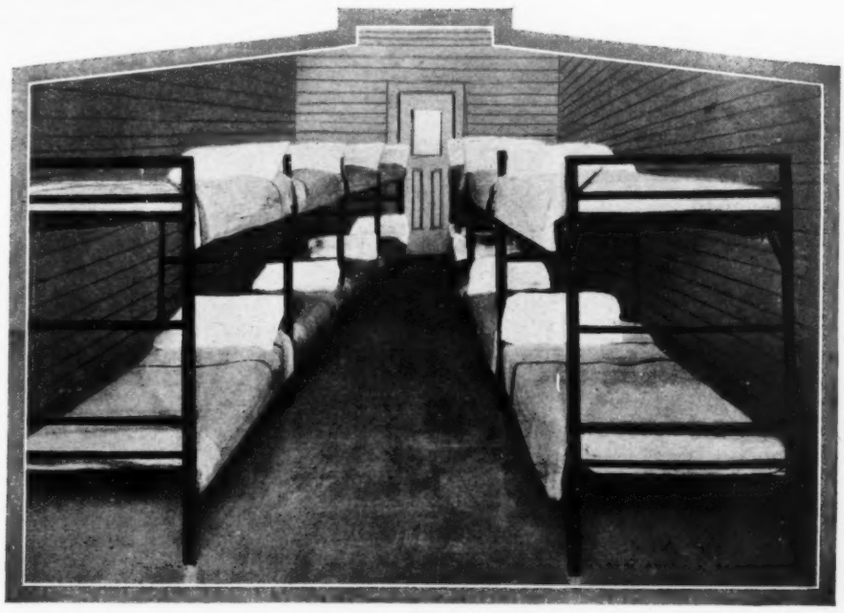
RAILROAD CAMP in box cars accommodating 120 men. Moving from place to place does not disturb operations.





DINING ROOM (at left) in railroad construction camp. Installed in box car to move along with the job.

BUNK CAR in railroad construction camp. Double row of cots provides sleeping quarters for labor crew.



Two Samples

Two hitches were made, one around the leg of the steeple and the other around the top. The leg was pulled out first

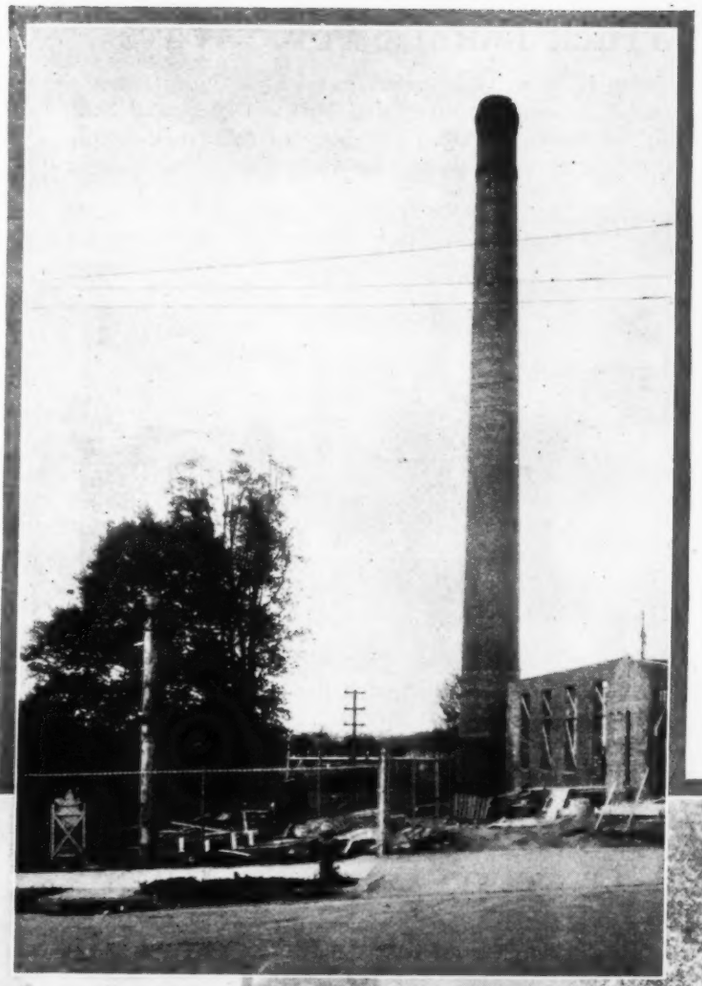
A LITTLE destruction usually is necessary before the average construction job gets underway so that a thoroughgoing knowledge of the construction business includes knowing how to tear things down as well as to build them up.

The three photographs on this page show how a Caterpillar tractor was used in wrecking the base of a brick steeple of the old Broad Street Methodist Church at Knoxville, Tenn., to make way for a modern building.

Above—After the leg had been removed, thus weakening the structure the Caterpillar tightened up on the main line and pulled down the steeple. The lower picture shows the falling steeple with the line slack

# of Destruction Methods

The two photographs on this page show the destruction of an obsolete brick chimney on the property of the Southern Power Co. at Winston-Salem, N. C. Dynamite was used for this job. Because of the fact that there was a building directly behind the stack, it was necessary to throw the chimney forward. A row of holes 1¼ in. in diameter and 22 in. deep were drilled around the front of the base 5 ft. above the ground and 15 in. apart and extending two holes back on each side beyond the center of gravity. A row of breaker holes also were drilled around the back of the base 8 ft. from the ground. These were not loaded as they were there merely to weaken the stack and help throw it in the desired direction. The two holes in the center of the row were loaded and shot first; then two more at a time, one on each side of the opening made by the blast, until only two on each side were left. These four were loaded and shot together. The dynamite used was 40 per cent Red Cross Extra. The job was handled by J. L. Dunn and W. C. C. Vanneman of the duPont company. The total cost of dynamite was about $10, only 16 lb. being used, with 16 electric blasting caps.

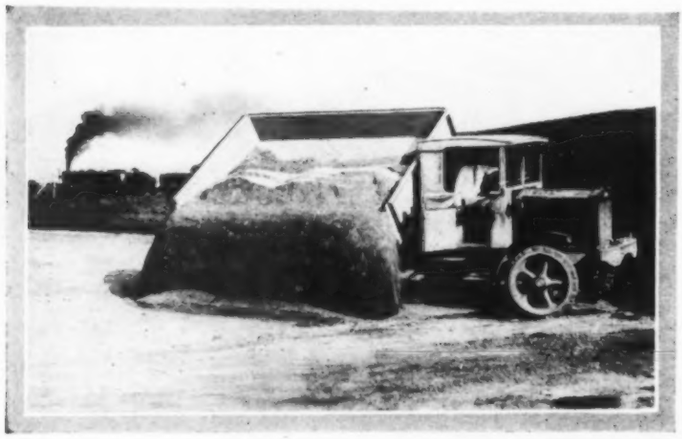


The chimney before it was brought down and the mass of wreckage showing some of the holes that were bored in the base of the stack to weaken it

NEW EQUIPMENT ON THE JOB

Truck Dumps Three Ways

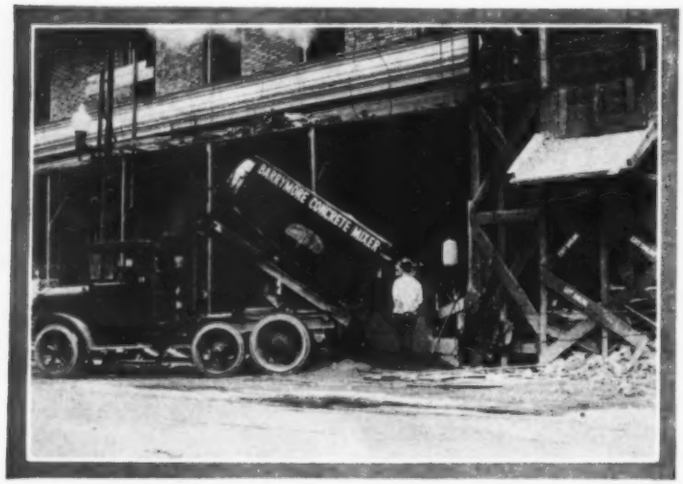
A dump body so constructed that it can dump material three ways is being manufactured by the Differential Steel Car Co. of Findlay, Ohio. The body of this truck is constructed so that material may be dumped to either side or



from the rear. In dumping from the rear a specially arranged end gate which is hinged at the top makes it possible to use the truck as a sort of spreader. The arrangement for side dumping makes it possible to dump material from two rows of trucks either in the center of the road or at the sides.

A Traveling Concrete Mixer

A traveling concrete mixer mounted on a truck has been put on the market recently by the Barrymore Concrete Mixer Corp. of San Francisco. This machine is an open-top affair

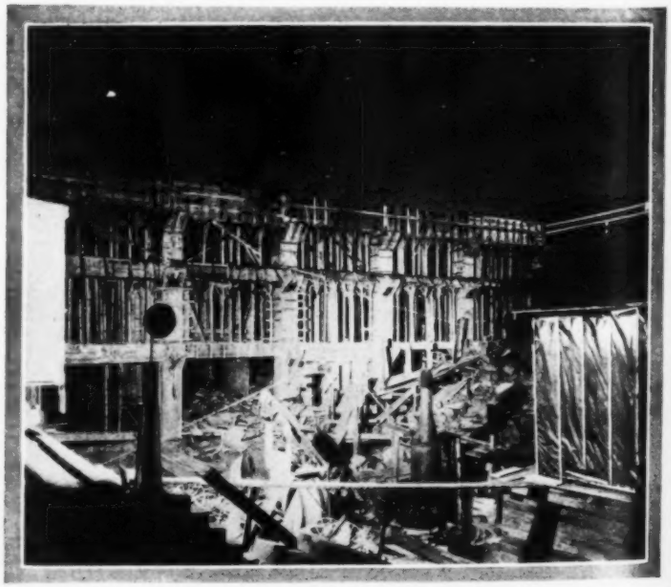


so that the aggregates may be dumped directly from bins or by loaders. It also is equipped with tanks in the side walls of the mixer body which hold sufficient water for each batch. When the mixer arrives at the place where the concrete is to be used, a valve on the water tank is opened and the drum is revolved. Sufficient water is provided so that there is enough left over to wash out the drum, thus preventing the residue of concrete from hardening while the machine is returning for another batch.

At present the Barrymore company is working out a plan for licensing operating companies with exclusive rights in various cities of the country. The machine shown in the photograph handles a 2½-yd. batch of concrete. At present these machines are in successful operation in the vicinity of San Francisco. They also are at work in Portland and Seattle.

For the Night Workers

The brilliant illumination in the accompanying photograph is furnished by one of the new No. 15 lights recently put out



by the Carbic Manufacturing Co. of Duluth. This light unit consists of three parts, water tank, gas bell and cake holder. Carbic cakes are used for fuel, and the light will burn 9½ hr. with one charging. The new light is equipped with a vertical swing joint which makes it possible to adjust the reflector to any desired angle and so concentrate the illumination on the part of the job where the light is most needed at the moment. The extent of the field covered by the light is well illustrated in the photograph.

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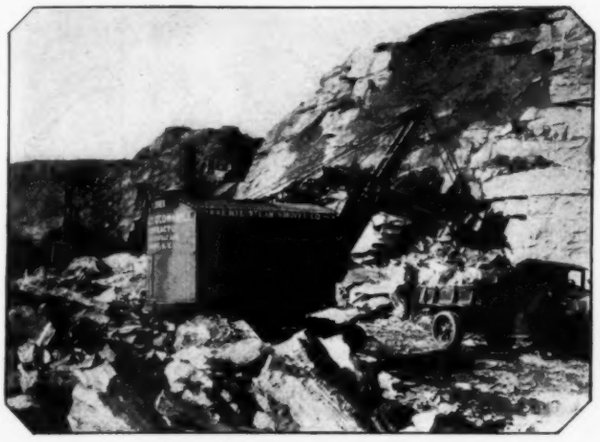

"My two ERIES went through this entire job, excavating 30,000 yds. of rock and 40,000 yds. of earth, without costing a cent except for dipper teeth and cable.

"Have been using ERIES 8 years and for the past 4 years have had two machines working steadily. In all that experience with ERIES I have been held up by the shovel just once. There is no comparison between the ERIE and other shovels."—*James O'Connell, Bronx, N. Y*

When you're buying a Shovel-Crane, get the facts from the man who has used several machines in hard steady work:

"We feel that we owe it to the ERIE Steam Shovel Co. to tell what our experience has been with our three Gas+Air ERIES," *writes M. R. Aldrich of W. Guncheon & Co., Harrisburg, Pa.*

"In seventy-five working days we moved more than 200,000 cubic yards of rough highway excavation, having a very high percentage of solid and loose rock, with three Gas+Air ERIES and one Steam ERIE.

"The Gas+Air machines give us splendid service, and if we had occasion to purchase additional excavating equipment we would most certainly stick to the Gas+Air ERIE.

"My conviction and honest belief is that within a very short time the Gas+Air ERIE will be the standard shovel of the country."

Make more money this season with the direct drive ERIE.

Direct-connected engines for crowding and swinging give an ERIE far more speed—you get BIGGER PRODUCTION.

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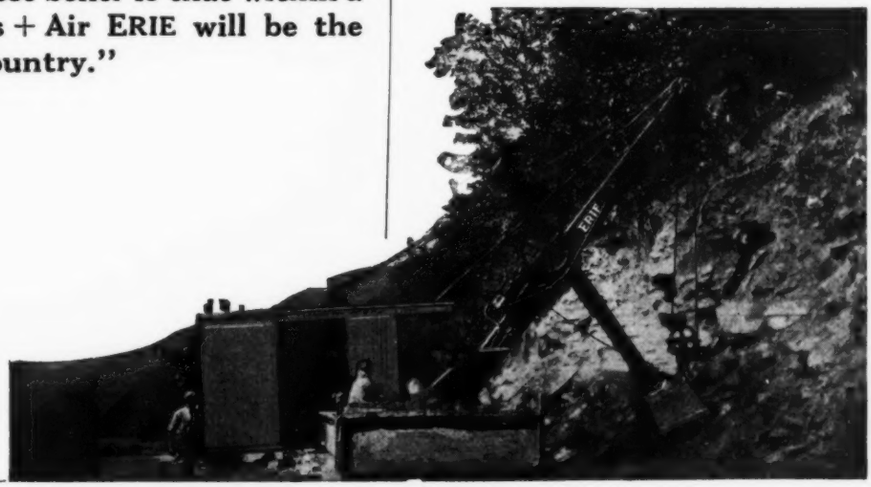
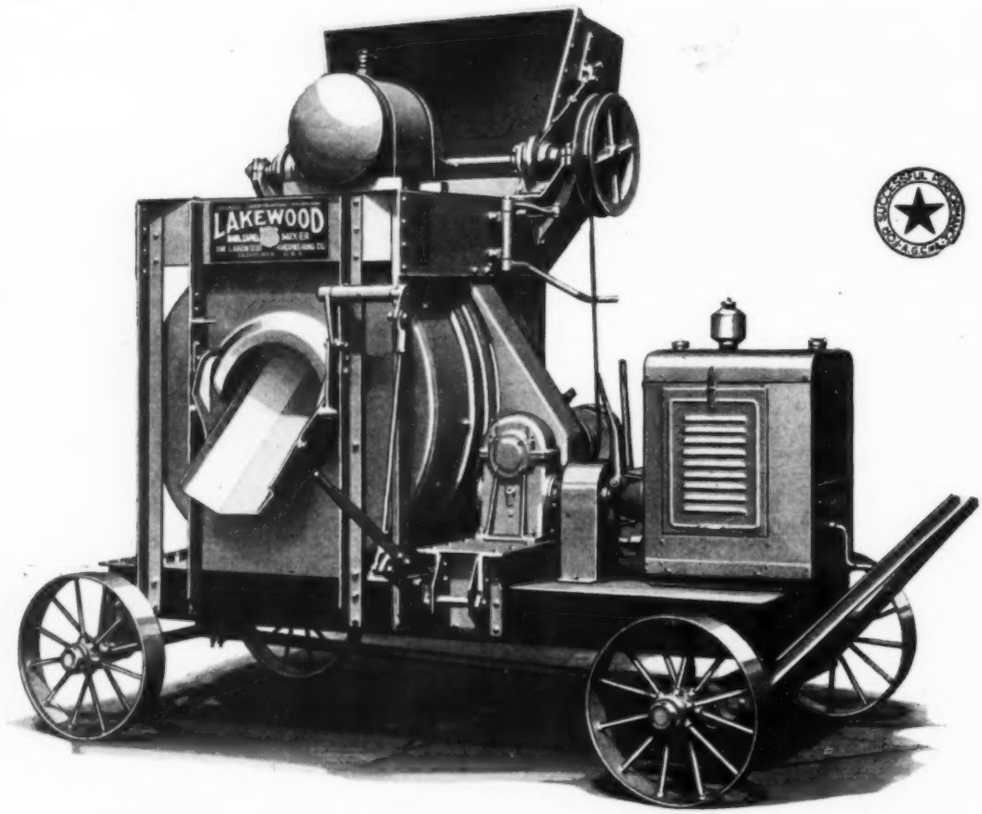


One of W. C. Guncheon & Company's three Gas+Air ERIES on a hard rock cut in the mountains, on state highway work.

GAS+AIR ERIE and Steam DREADNAUGHT

SHOVELS, CRANES, DRAGLINES, ETC

The New



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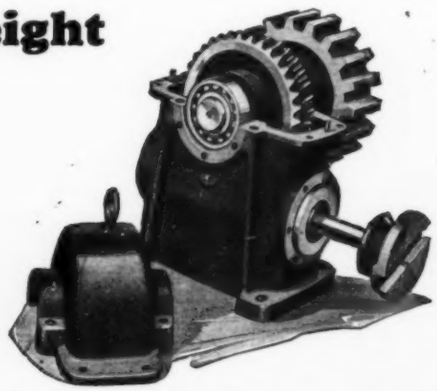
Greater Strength—Less Weight

Dead weight of castings eliminated by pressed steel parts. Machine complete with power, loader and water tank weighs only 4860 lbs.

And the new 10-S has all the other advantages of the Lakewood Worm Speed Reduction Concrete Mixers.



The Worm Speed Reduction. All high speed parts enclosed and running in oil. Exposed gears are eliminated

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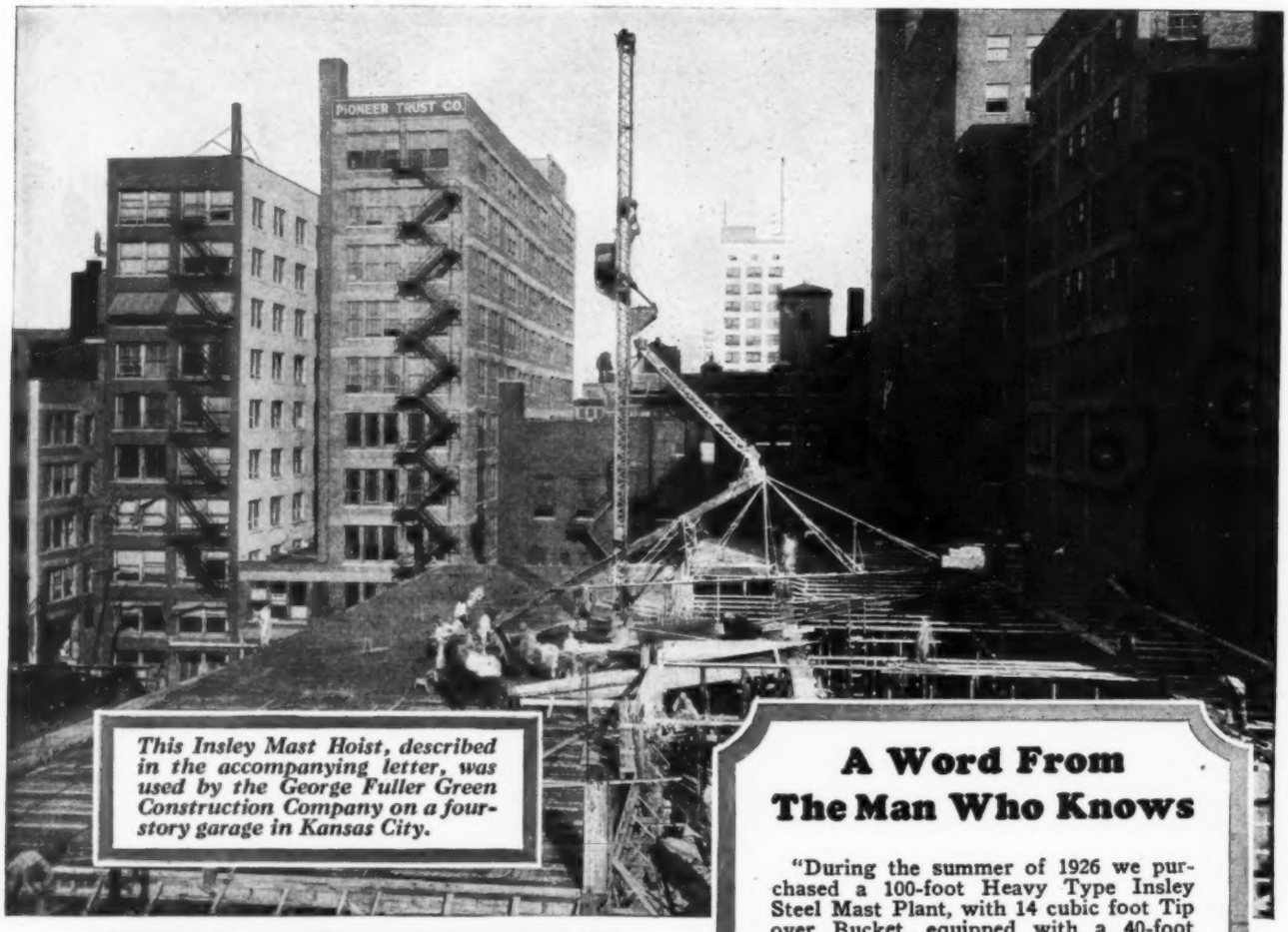

This Insley Mast Hoist, described in the accompanying letter, was used by the George Fuller Green Construction Company on a four-story garage in Kansas City.

TWO MEN HANDLE EIGHTY FEET OF CHUTE

THE boom and counterweight feature of the Insley Mast Hoist is a money maker. Instead of placing concrete with a crew of eight or ten men pushing concrete carts, some of the most able contractors are placing it with only two or three men shifting chutes.

The Insley Mast Hoist handles all the concrete your mixer can mix, and places it where you want it, with the minimum expenditure of time and labor in shifting from one location to another.

The Boom and Counterweight is only one of many labor saving features which place the Insley Mast Hoist in a class by itself. The erection gin pole which is mounted on the bucket, the field splice with only twenty bolts, and the three Wheel-barrow Material Elevator are all details you should know about.

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A Word From The Man Who Knows

"During the summer of 1926 we purchased a 100-foot Heavy Type Insley Steel Mast Plant, with 14 cubic foot Tip over Bucket, equipped with a 40-foot Boom Chute and 40-foot Counterweight Chute, and we are so well pleased with this outfit that we are writing you to let you know the success we have had with it in our work.

"By leaving out a small portion of the slab and joist in the center of the building we were able to locate at this point, and successfully chute concrete to all points without the necessity of carting concrete during the entire job.

"We also wish to comment on the ease with which this tower was erected, as I don't recall any instance where a drift pin was necessary to make connections.

"As before mentioned, chuting of concrete was very successfully handled, one man being able to swing the counterweight chute together with the boom chute.

"In conclusion, we can highly recommend this latest type plant as a good investment for the contractor who specializes in work of this kind."

George Fuller Green Construction Co.
(Signed) By M. G. Losee.

524

INSLEY MANUFACTURING COMPANY - Indianapolis

Engineers and Manufacturers

Erecting steel on St. Louis' $4,000,000 Civil Courts Building. This work is being done by the St. Louis Steel Erection Co. Substructure work was done by Fruin-Colnon Contracting Co. Both contractors use "HERCULES" Wire Rope. The structure at the left is the recently completed Bell Telephone Building. "HERCULES" also handled all of its steel and stone.

"Hercules" at Home

The accompanying illustration shows "HERCULES" (Red Strand) Wire Rope at work on a big job in its home town.

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ST. LOUIS

New York Chicago Denver San Francisco

Le Roi Six Makes 'Em Dig!

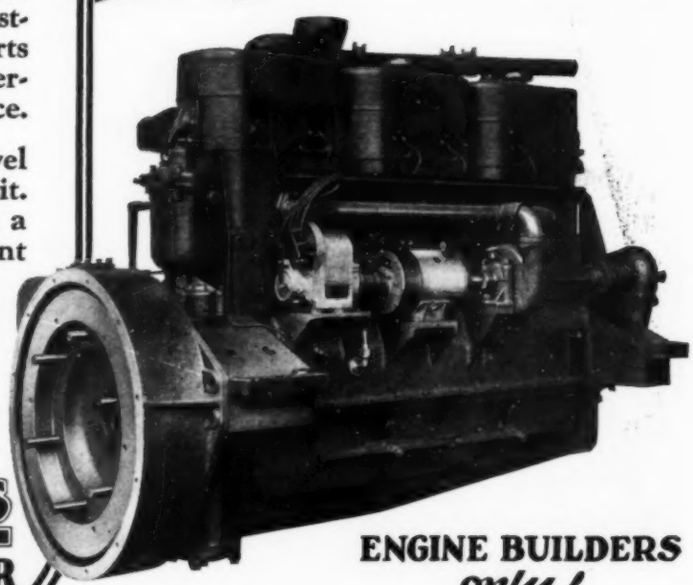
SMOOTHER power, more economical power, surplus power — that's what you get from the Le Roi Heavy Duty Six Cylinder Engine. That's why it is now being used on the heaviest of construction equipment. It boasts of its greater flexibility, *greater acceleration*, less vibration, — all at a surprisingly low operating cost.

The Le Roi Six is of the valve-in-head design and gets the maximum power out of every explosion. Its force-feed lubrication is fool-proof and trustworthy. "Over-size" working parts and remarkably vibrationless operation assure a long life of service.

Watch the Le Roi Six. The Shovel shown above is equipped with it. The next time you are buying a piece of heavy duty equipment consider its power — see that it has a Six Cylinder Le Roi. Let us tell you why.

LE ROI COMPANY
MILWAUKEE, WIS.

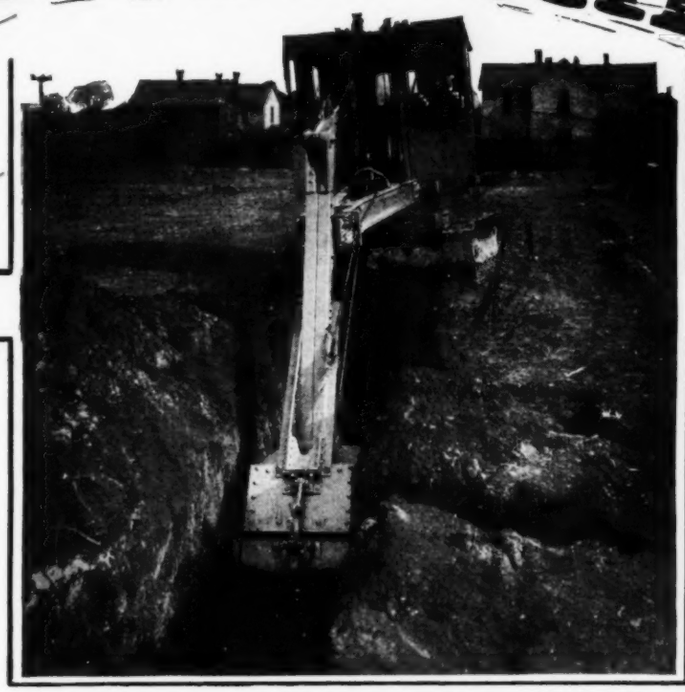
LE ROI ENGINES
3 to 160 HORSE POWER



ENGINE BUILDERS *only!*

And NOW The Perfected Utility as a TRENCHER

The Product *of Specialists*



THE GENERAL EXCAVATOR TRENCHER has a single line pull at the bucket of **18,000** pounds.

IT WILL DIG A TRENCH 16 feet deep, 24", 30", or 36", wide with ease. Bucket will reach to height of 27 feet above Ground.

GENERAL EXCAVATOR AS A TRENCHER DIGGING A TRENCH 30" WIDE 16' DEEP

The Strength of a Giant!
The flexibility of a Fine Automobile!
The ruggedness of an Oak Tree!
The mobility of a bicycle!
The capacity of machines of higher rating!

Double independent drums gives complete control of machine and bucket at all times. Full revolving means ability to dump spoil at the front, on either side or at the back. All machinery back of the center pin means perfect balance and light counterweight. Truck frame is single Alloy Steel Casting and weighs more than a ton. All operating machinery fixed to Unit Cast Steel Center Member or foundation. Almost ninety per cent. of weight — more than seventeen Tons — is in Alloy Steel Castings — no structural members rivetted together. So many superb features it takes a book to recite them — send for bulletin 2703 and familiarize yourself with the most sensational Digging Tool ever created. Thirty-five years "in built" experience in the design and manufacture of Shovels, Crane and Dredges. Convertible in the field without skilled labor or the addition of any operating machinery to Shovel, Crane, Dragline.

Now in the service of some of the foremost Contractors in North America. Sold by the leading Contractors Equipment Distributors — there is one near you.

The General Excavator Company
Marion, Ohio, U. S. A.
Built to SERVE, SATISFY and SURVIVE


Trailer Bins


Sectional Bins


Agrabatchers


Road Forms


Curb and Gutter


Sidewalk Forms

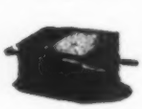

Joint Machines


Finishing Machines


Traveling Bridges


Car Unloaders


Mixing Boxes


Tool Boxes

Time Steals Your Profits

Time takes a costly toll on every job where only partially efficient forms are used.

Making its daily rounds to your cash drawer every hour of the working day—relentlessly robbing you of profits that your hard work has justly earned—time deprives you of the luxuries that should be yours.

HELTZEL Steel Curb and Curb and Gutter Forms reduce your time losses almost to nothing. They permit your workmen to set a given number of feet of forms in less time than with any other equipment.

A better job results.
A more profitable job.

The front and back rails and division plates are assembled in a jiffy. The adjustable notched stakes and adjustable hanger clips immediately bring them to grade and line. The long wings on the division plates prevent the front and back rails from spreading and the overhead hangers prevent the face rail from spreading or creeping up.

Here is efficiency. Here is quick work. Here is a complete elimination of the theft of time.

FOR SUCCESSFUL PERFORMANCE A.G.C.-A.E.

The HELTZEL Catalogue of Curb and Gutter Forms shows every type of curb construction much of which can be built with standard curb and gutter rails, there being nothing special but the division plates and method of support.

No Cost or Oligation. Write for it.

THE HELTZEL STEEL FORM & IRON CO. - WARREN, OHIO

HELTZEL

Building Highways Through Mountains of Rock

ROAD-BUILDING methods have progressed greatly in the past few years. One no longer rides up and down small hills and around numerous bends and curves on important highways.

Safety demands straight, wide, "clear-visioned" roads to handle the present-day heavy travel. Grades are now cut down so that the motorist enjoys the easy riding of the city street even in mountainous regions.

"Jackhamer" Drills have made possible the grading for these roads. The removal of rock and shale is now a fast, easy operation.

The "Jackhamer" is a rugged, powerful hammer drill. It will quickly and easily drill holes to twenty-five feet, even in the hardest of rock. There are six sizes of "Jackhamer" Drills—a right machine for each drilling job. Let us tell you all about them.

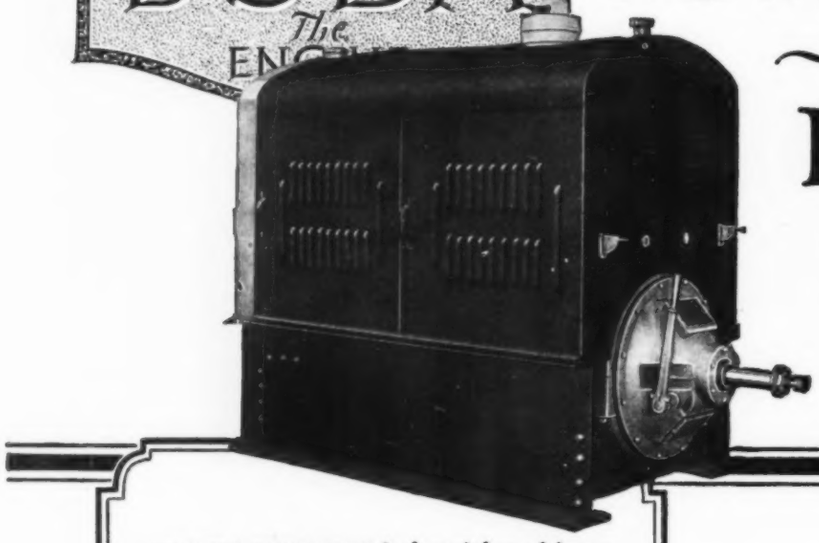
INGERSOLL-RAND COMPANY
11 BROADWAY, NEW YORK CITY
Offices in principal cities the world over
For Canada Refer—Canadian Ingersoll-Rand Co., Limited, 10 Phillips Square, Montreal Quebec

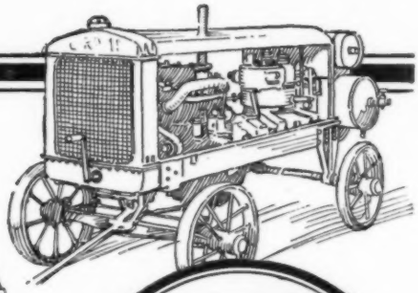
320-JD

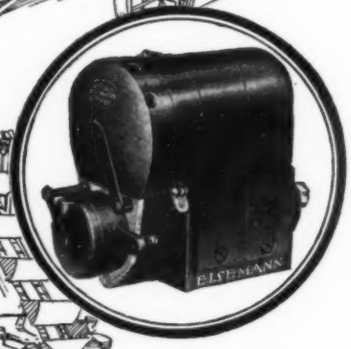
Ingersoll-Rand

BUDA *The* ENGINE

POWER PLANTS *are* Eisemann Equipped







BUDA-EQUIPPED industrial machinery is not tied up, every so often, because of faulty ignition.

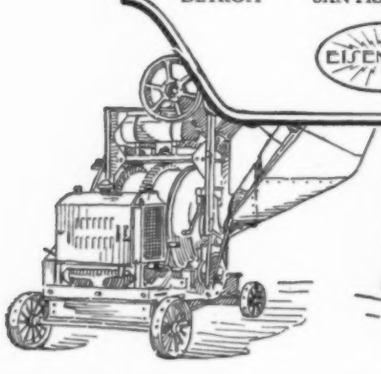
No matter what the service, or size of engine employed, the magneto functions uninterruptedly—day in and day out.

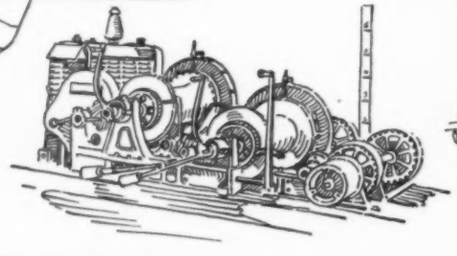
This freedom from ignition trouble means much to Buda users. Operators of heavy equipment—such as shovels, excavators, loaders and the like—have found that it has a vital effect on Profits.

And, it explains why Buda has been a consistent user of Eisemann Magnetos for the past ten years.

EISEMANN MAGNETO CORPORATION
165 Broadway, New York
DETROIT SAN FRANCISCO CHICAGO

EISEMANN

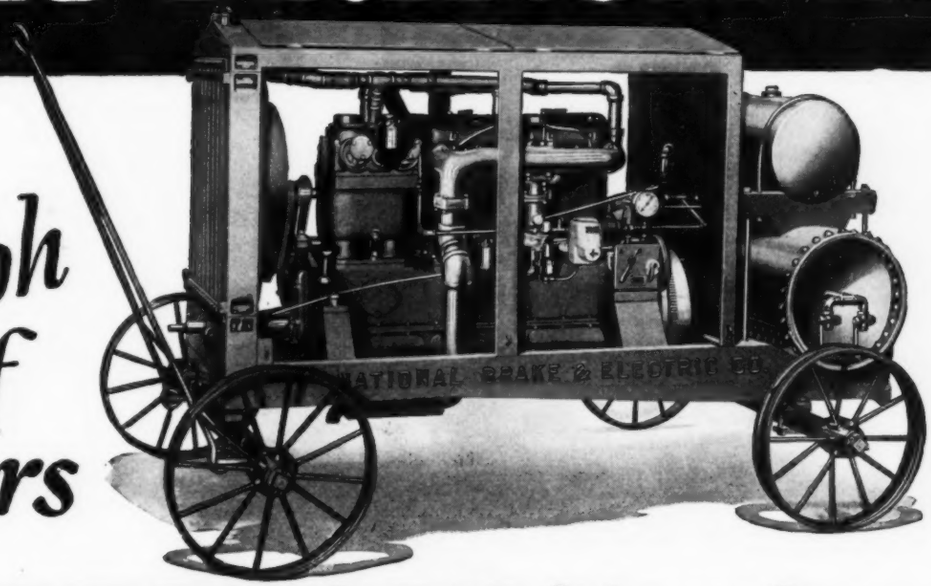




EISEMANN
ELECTRICAL EQUIPMENT

UNIT PRINCIPLE

the triumph of **31 *years***



COMPRESSOR *Manufacture*

AS an important subsidiary of the Westinghouse Air Brake Company, the National Brake & Electric Company, of Milwaukee, has available the research and engineering resources of the parent organization — derives, also the direct benefit of its specialized experience in the manufacture of air-operated equipment.

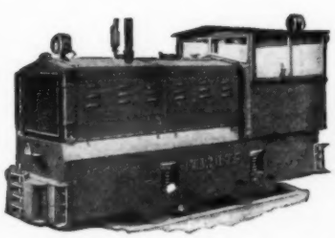
It is with this background, plus *thirty-one years' compressor manufacturing experience in our own right,* that we now offer the users of pneumatic tools the Westinghouse-National UNIT PRINCIPLE, gasoline engine-driven, portable Air Compressor.

National Unit Principle Air Compressors are built in 110, 160, 240 and 330 Cu. Ft. sizes; standard mountings.

National AIR COMPRESSORS
A WESTINGHOUSE PRODUCT

[*Exclusive territorial sales franchises available*]

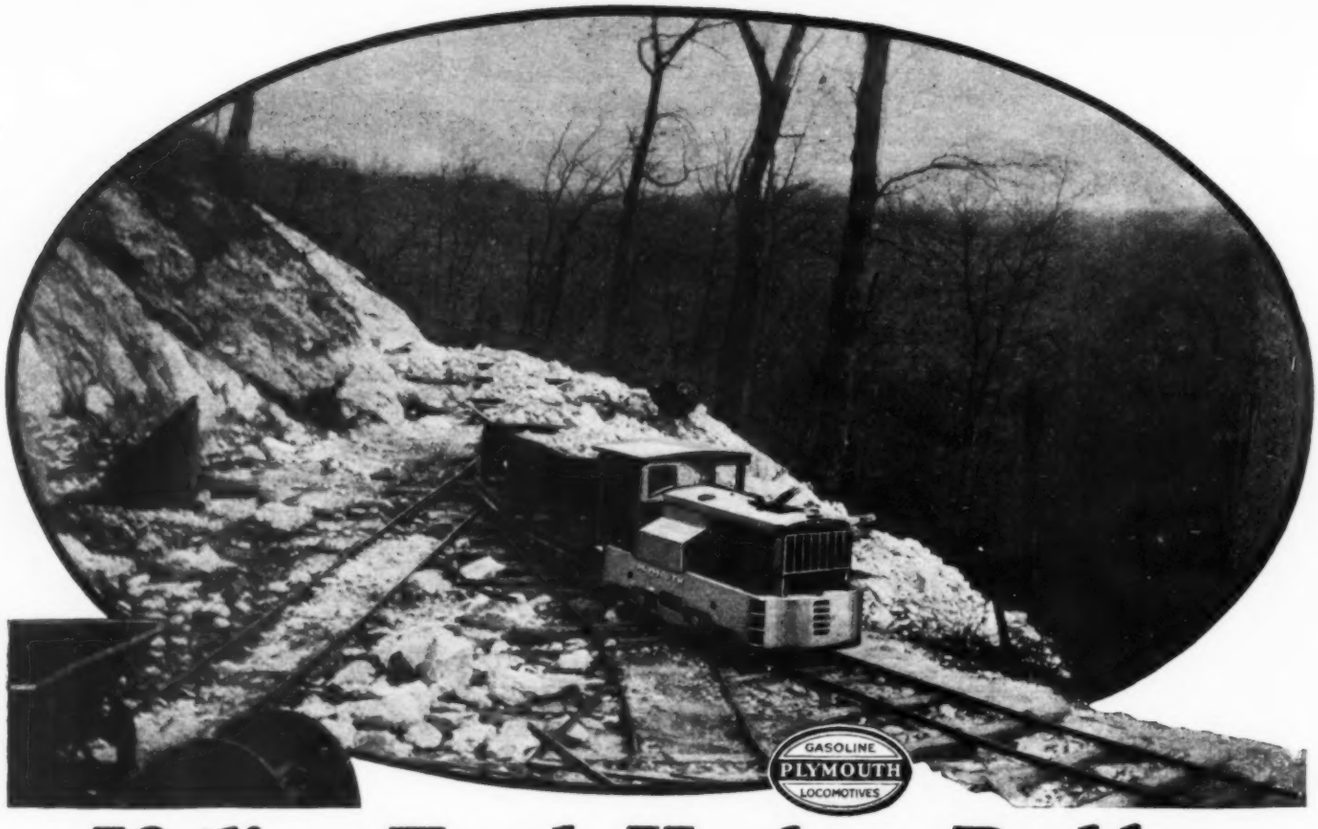
NATIONAL BRAKE & ELECTRIC COMPANY
Division of Westinghouse Air Brake Company
MILWAUKEE, WISCONSIN



Milwaukee Gasoline Locomotives will solve your haulage problem. All sizes, all gauges. Pioneer builders of gasoline locomotives since 1907. Get acquainted with our Model Type "H".

MILWAUKEE
LOCOMOTIVE MFG. CO.
Subsidiary of National Brake & Electric Co.
MILWAUKEE WISCONSIN

MILWAUKEE *Gasoline* **Locomotives**
Another Westinghouse Product



If it's a Track Haulage Problem There's a PLYMOUTH to solve it

And in this isolated high altitude location a Plymouth has been solving the problem for over two years.

The Erwin Feldspar Company uses this four-ton Plymouth near Spruce Pine, N. C. to haul feldspar two miles from mines to an elevation of over 4,000 feet.

Mr. Deneen, General Manager of the Erwin Feldspar Co., says:

"In over two years since we installed the Plymouth locomotive shown in the pictures enclosed, our repairs have been less than $10.00 per year. The locomotive is also in an isolated place where there is little chance to do work on it other than to oil and adjust it.

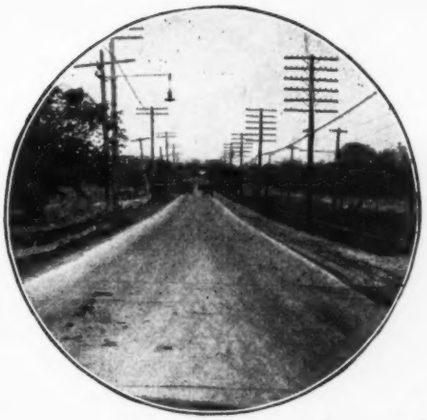
"Our locomotive works perfectly at 4,000 feet elevation. In fact, we have had no trouble at all with it, although it works under pretty rough conditions.

"Where we are working, lack of roads would make the cost of delivery of coal for a steam locomotive prohibitive. With our gasoline locomotive, we also eliminate need for keeping up a water supply as would be required for a steam locomotive."

We need not add to what Mr. Deneen has said. Think over what you could do with a locomotive that will give this kind of service.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
PLYMOUTH, OHIO

PLYMOUTH
Gasoline Locomotives



Heavily traveled National Highway, near Springfield, Ohio, built in 1920. Carey Elastite Expansion Joints, installed in ¾" thicknesses, are responsible in part for the excellent condition of the concrete.

Over six years old

"...and in as good condition now as on the day they were laid!"

Few men anywhere throughout the Middle West have made a more intensive study of concrete construction in its every phase than William E. Lucas, City Engineer of Springfield, Ohio. Nor have many men done more to improve the roads of their community.

"IN the design of modern concrete pavements," said William E. Lucas, City Engineer of Springfield, Ohio, "two of the properties of concrete are of extreme importance—the expansion and contraction due to changes in moisture and temperature.

"Some engineers may doubt the economy in the use of expansion joints, but in cases where they are not used, a study of the resulting stresses will invariably show that the concrete is in constant danger. Unless adequate provisions are made, disintegration will result from irregular shrinkage.

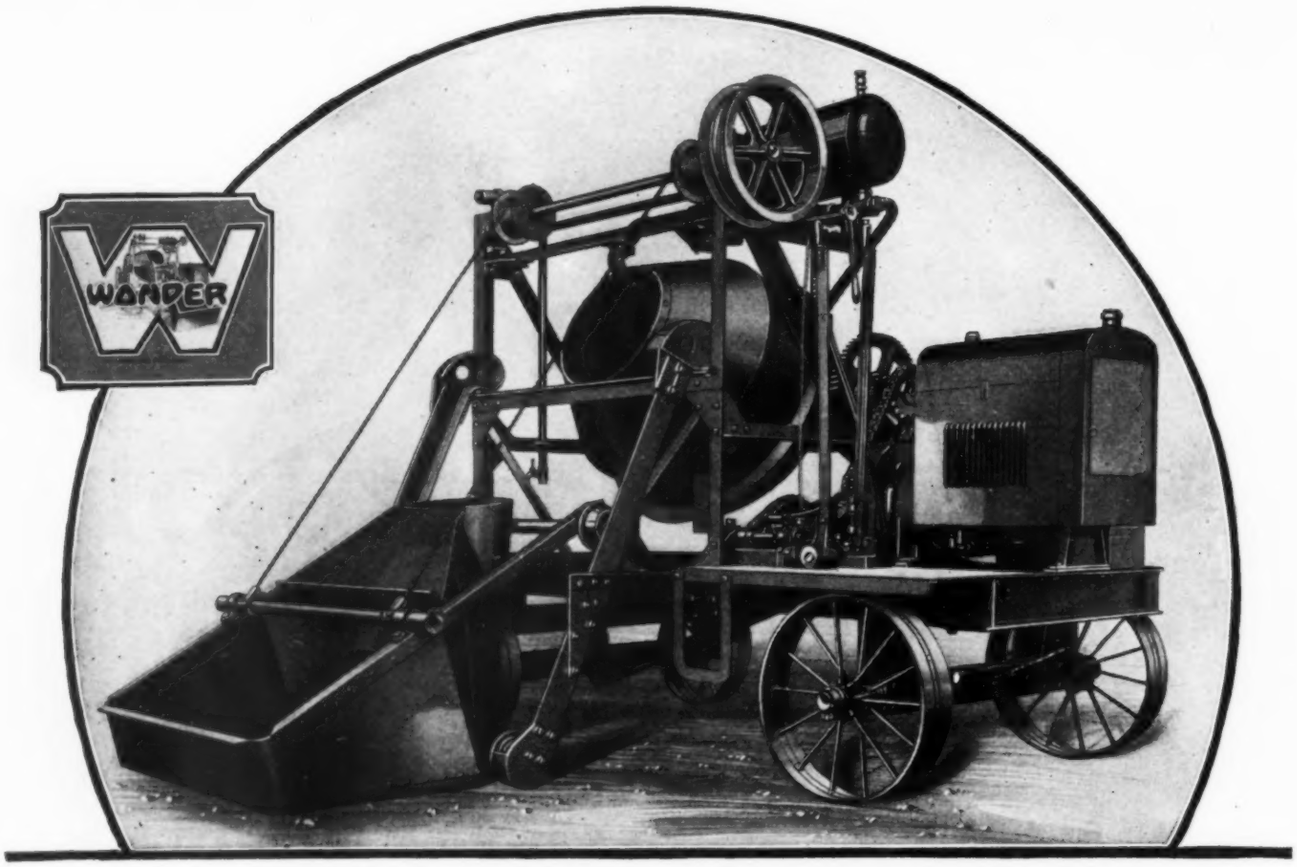
"Here in Springfield, our specifications provide for transverse joints every 30 feet, straight and perpendicular to the center line of the pavement, and extending the full depth of the concrete. Longitudinal joints protect each curb line, and all catch basins, manhole covers, valves, or other fixed objects are separated from the concrete by joint filler.

"Our oldest concrete pavements, built more than six years ago, are in as good condition now as on the day the concrete was laid. Expansion joints are adding appreciably to their life."

Many of the concrete streets and highways in and near Springfield are lastingly protected by expansion joints — Carey Elastite Expansion Joints in practically every case. Have us tell you more about this inexpensive, indispensable material. Write for particulars.

THE PHILIP CAREY COMPANY, *Lockland*, Cincinnati, Ohio

Carey Elastite
EXPANSION
JOINT



Wonder 14-s——1927 Model

10 Seconds to Charge—5 Seconds to Discharge

THE rapid charging and discharging of the WONDER "14" combined with the fast and thorough WONDER mixing action enables you to greatly increase your daily yardage.

This is accomplished without sacrificing mixing time because the WONDER "14" charges in 10 seconds and it requires but 5 seconds for the entire mixed batch to pour from the drum.

The WONDER power tilt is the highest development in a power discharge. It is simple, rapid and positive in action, automatically stops in both the charging and discharging positions and is the first successful power tilt used on a Single Opening Tilting Mixer.

The loader is of the track type with its extension advantages. A four cylinder 10-15 H. P. power plant insures a surplus amount of power.

The WONDER catalog fully describes this model. Send for your copy today!

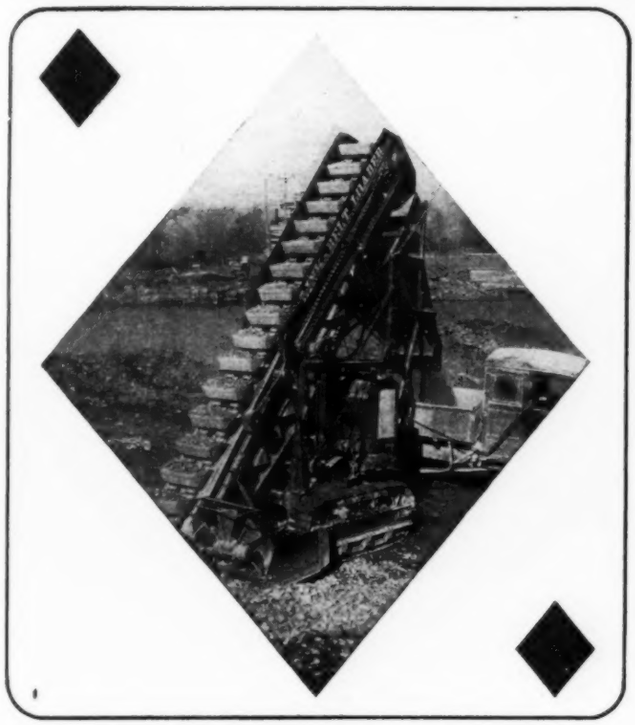
Construction Machinery Co.
WATERLOO, IOWA

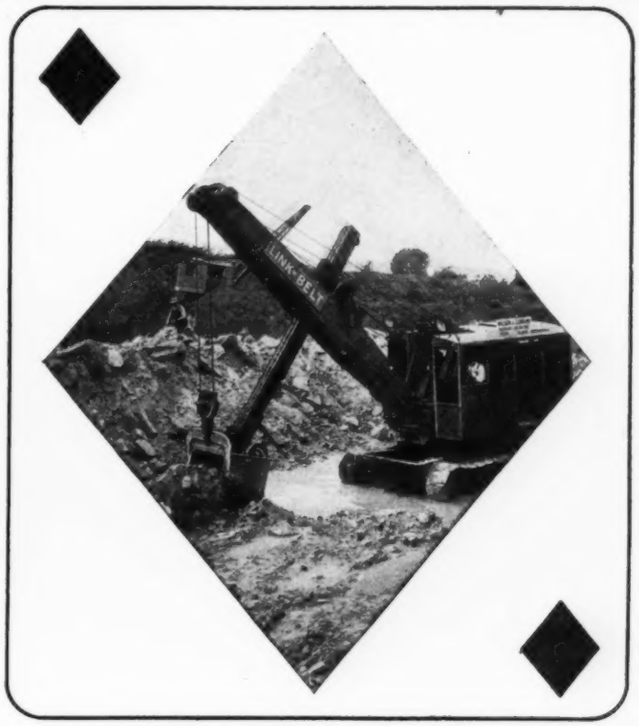
WONDER Mixers are available for immediate delivery from our nearest distributor to you. There are WONDER distributors with complete stocks in all principal cities.

WONDER MIXERS

A PAIR OF DIAMONDS IN THE ROUGH

The Rougher it is, the better they like it—





Link-Belt "Grizzly" Loader

Truly a "Bear for Work". Crawls in any direction, digs, feeds itself, and loads—and does it with astonishing speed and savings.

Built for the rough, tough loading job, yet it is ideally suited for general contracting service, such as reloading and batching of advance storage piles on road building work.

We shall be glad to answer your questions. Send for Catalog No. 924.

Link-Belt Crawler Shovel

Here's a piece of "worry-free" equipment that makes the tough jobs seem easy. Put it on your payroll—it will earn a profit for you.

Link-Belt Shovels for contracting and industrial uses are increasing in favor because of the exclusive Link-Belt features that mean speed, operating convenience and reliability. The inherent advantages of Link-Belt design, guarantee economical performance day after day. Get the facts. Send for Book No. 895.

LINK-BELT COMPANY

3148

Leading Manufacturers of Elevating, Conveying, and Power Transmission Machinery and Chains

CHICAGO, 300 W. Pershing Road — **INDIANAPOLIS, 200 S. Belmont Ave.** — **PHILADELPHIA, 2045 Hunting Park Ave.**

Ashland, Ky.
V. P. Dalmas & Co., 100 W. Winchester Ave.
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Birmingham, Ala. . .229 Brown-Marx Bldg.
Boston . . . . . 1103-4 Statler Bldg.
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Denver . . . . . 520 Boston Bldg.
Detroit . . . . . 5938 Linsdale Ave.
Huntington, W. Va., Robson-Prichard Bldg.
Kansas City, Mo., R. 436, 1002 Baltimore Ave.
Louisville, Ky. . . . 349 Starks Bldg.
Minneapolis, Minn.
Link Belt Supply Co., 418 S. Third St.
New Orleans, 504 New Orleans Bank Bldg.
New York . . . . 2676 Woolworth Bldg.
Pittsburgh . . . . . 335 Fifth Ave.
St. Louis . . . . . 3638 Olive St.
Wilkes-Barre, 826 Second National Bank Bldg.

H. W. CALDWELL & SON CO.:—Chicago, Western Ave., 17th and 18th Sts.; Dallas, Texas, 1221 Mercantile Bank Bldg.; New York, 2676 Woolworth Bldg.

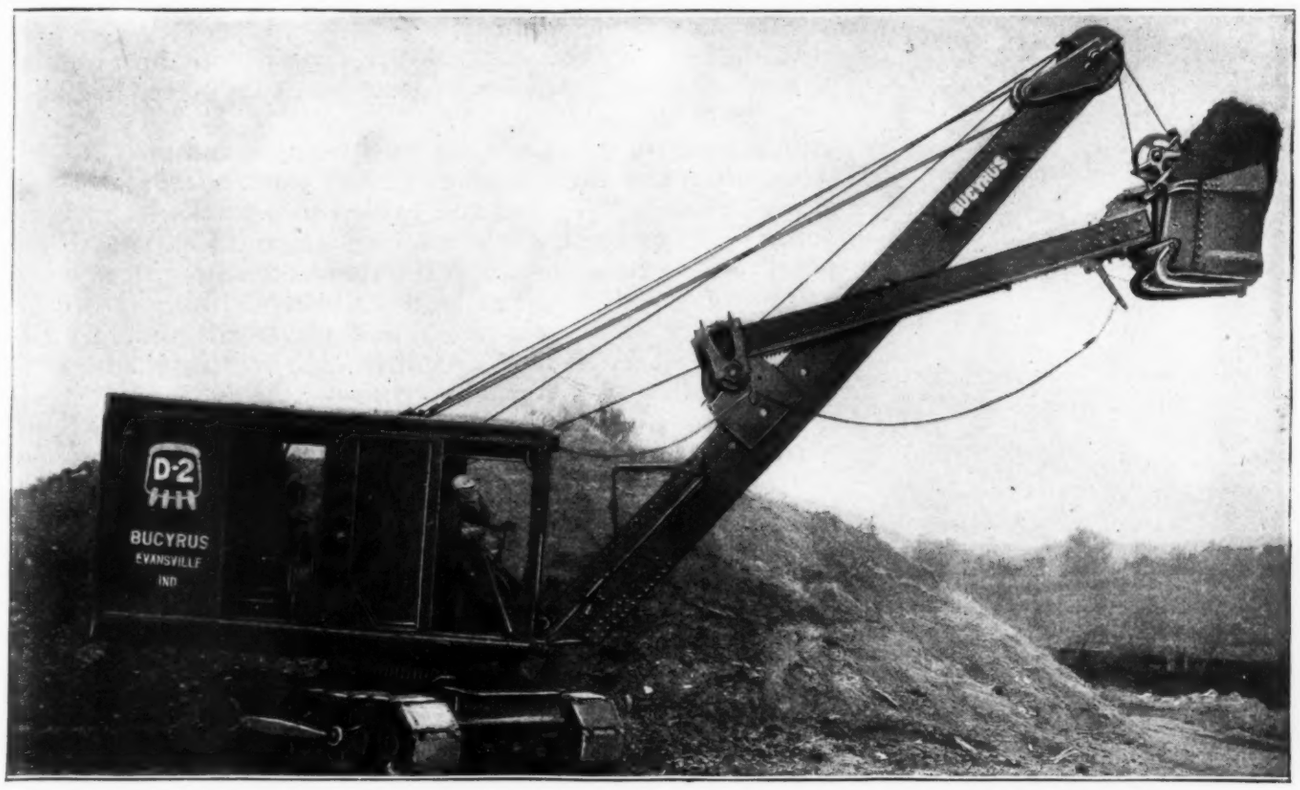
LINK-BELT MEESE & GOTTFRIED CO.:—San Francisco, 19th and Harrison Sts.; Los Angeles, 361-369 S. Anderson St.; Seattle, 820 First Ave., S. Portland, Ore., 67 Front St.; Oakland, Calif., 526 Third St.

In Canada—LINK-BELT LIMITED—Toronto and Montreal.

LINK-BELT

Shovels and Loaders

The Brand New 1-Yard Bucyrus Diesel



Faster Digging—Full Diesel—Low Costs

Having introduced the Diesel shovel five years ago Bucyrus announces a new machine—the only seasoned Diesel shovel on the market today.

The smoothness of steam—the big yardages of the Bucyrus high speed hoist and swing—and the low cost of Bucyrus full-Diesel power are provided by this new 1-yard Bucyrus Diesel.

It is built for the man interested in moving more dirt at a lower cost per yard.

Its swinging machinery accelerates faster—means more swings per hour.

The two-part hoist hoists the loaded dipper faster—means more passes per hour.

D-2 DIESEL
Convertible To DRAGLINE or CRANE

And coupled with this speed is the low-cost operation of the Bucyrus-Atlas Full-Diesel engine—the engine that has cut fuel costs six to eight dollars per day.

And there is a 20 to 40 per cent power surplus for smooth operation.

Here is a simple shovel that actually makes more passes and more swings, with far lower operating cost per day.

If you're interested in digging more dirt with far fewer dollars, send for a copy of Bulletin D-21-2. A post card brings it.

BUCYRUS COMPANY, South Milwaukee, Wisconsin

BUCYRUS

NEW YORK CHICAGO BIRMINGHAM SAN FRANCISCO PITTSBURGH TOKYO LONDON

Built on this Foundation

UNIVERSAL

TRUCK CRANES

Universals are built on a foundation of Speed—Speed in traveling from job to job—Speed in operation—and Speed in earning you big profits.

Mounted on motor trucks, Universals are the most mobile of cranes—they speed from job to job, anywhere, anytime, 15 to 25 M.P.H.

Operating speed is assured by a swing speed of 6 R.P.M. (faster than any similar crane), high hoist speeds and one man operation. "We dug and loaded into trucks, 416 yds. in 8 hrs."—"Our best day's run was laying 1200 ft. of 45" pipe," etc.,—these are typical reports on how Universal operating Speeds result in large daily capacities.

There are 12 interchangeable crane attachments for the Universal—Trench Hoe, Dragline, etc., making it adaptable to practically every type of work.

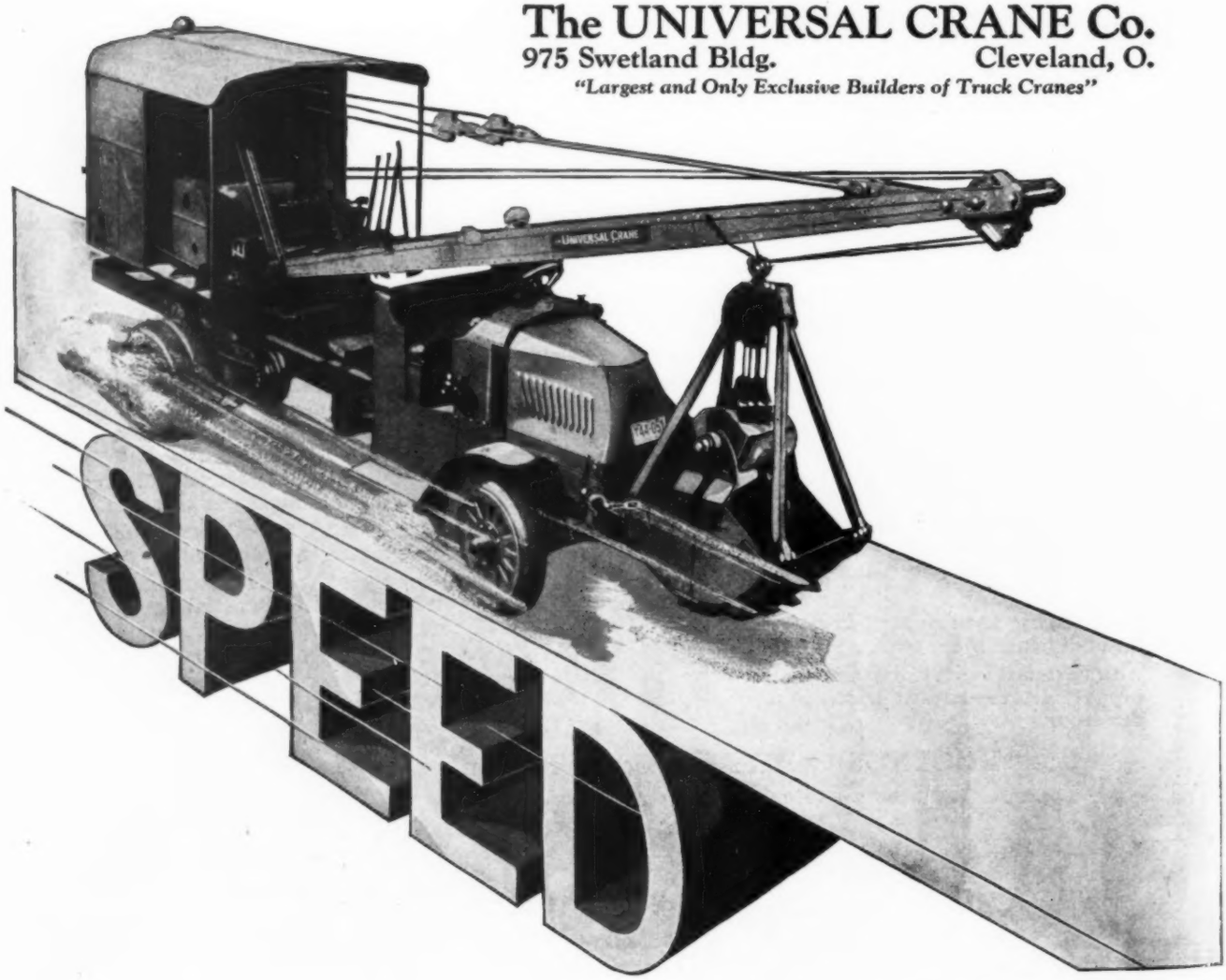
Combine this Universal all-purpose usefulness with Universal speedy mobility and operation and you'll realize why Universals produce the results that mean big profits. Ask any Universal owner!

Write for Bulletin No. 366—it explains how Universal Speed will speed up your job.

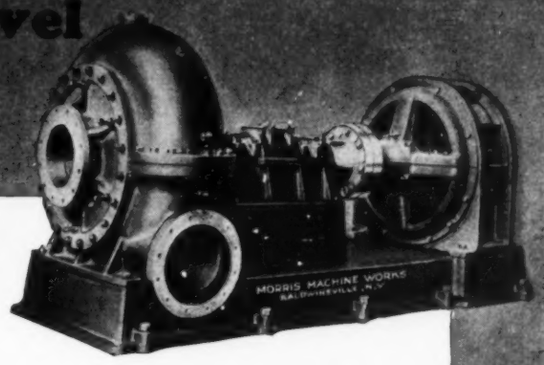
The UNIVERSAL CRANE Co.

975 Swetland Bldg. Cleveland, O.

"Largest and Only Exclusive Builders of Truck Cranes"



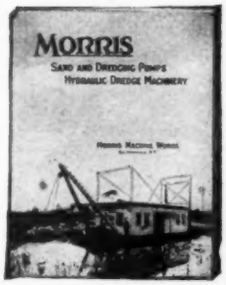
For handling heavy gravel and coarse material containing stones



CONTINUOUS big production of heavy, highly abrasive material is best assured by the

Morris Solid-Lined Dredging Pump

because the renewable hard cast iron or manganese steel shell and disc liners can be removed and replaced with minimum expense and delay. The liners require no special fitting, and if a spare set is not on hand, spares for all the popular sizes can be shipped immediately from our plant.



Material like that shown below can be handled economically by this type of pump through a lift of 80 ft. or higher and through lines of up to a mile in length.

With these pumps, any solid materials (sand, gravel, small boulders, spoil, crushed rock, coal, ashes, etc.) that can be mixed with water and moved through a pipe, are easily transferred from one location to another. The only expense is for pump power and getting the material into the suction end of the pipe.

Write for Bulletin 125

56 pages with over 125 illustrations showing where, why and how hydraulic methods should be used. This book will post you on the best modern practice, what can be done with pumping outfits of various types and sizes and what arrangement is most desirable under existing conditions.

Even though not now in the market for new equipment, you should have this booklet in your files for ready reference.

Sent free on request.

If you are interested in hydraulic transfer, excavation, filling, disposal, sand and gravel production, etc., our Engineers will be glad to submit costs and performance data. At least write for Bulletin No. 125.

Morris Machine Works

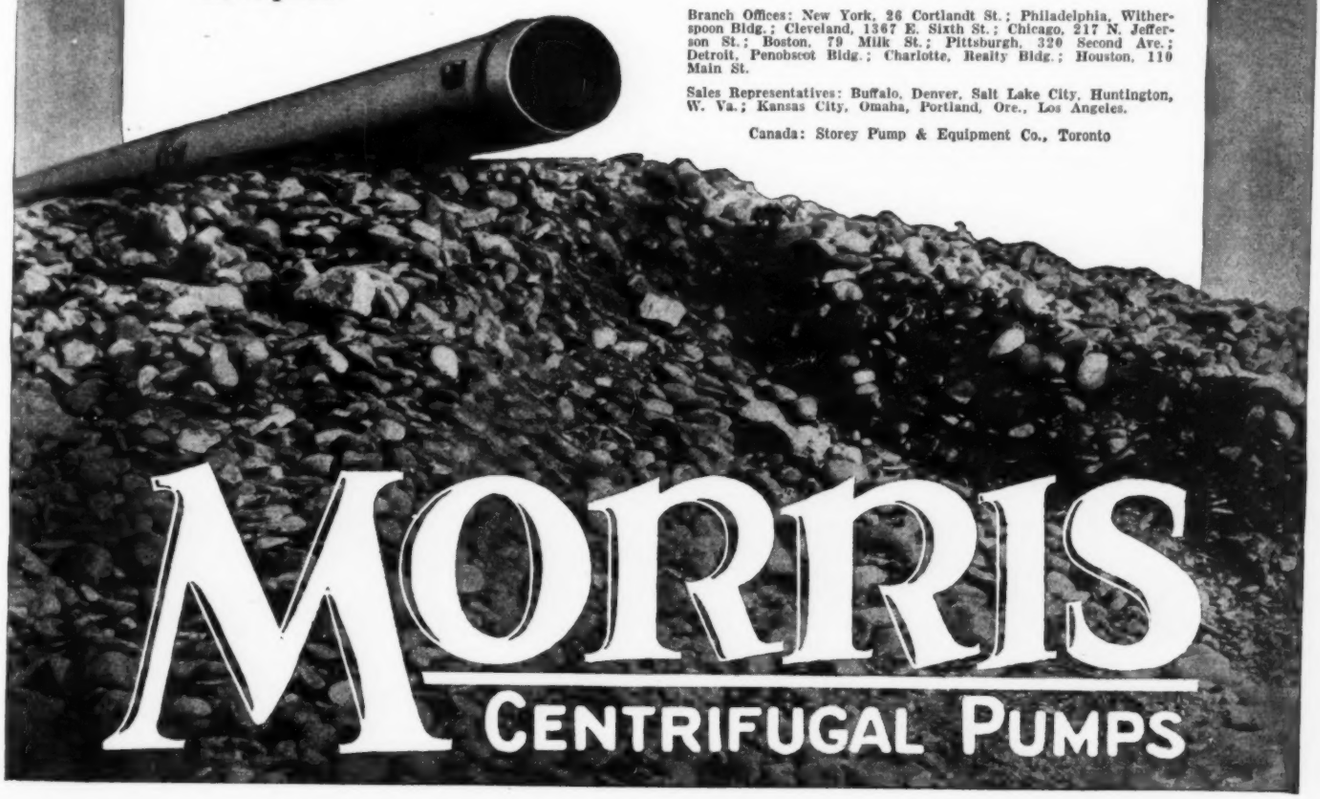
Baldwinsville, N. Y.

Originators of centrifugal pumps, both single and multi-stage, and builders for practically all purposes since 1864

Branch Offices: New York, 26 Cortlandt St.; Philadelphia, Witherspoon Bldg.; Cleveland, 1367 E. Sixth St.; Chicago, 217 N. Jefferson St.; Boston, 79 Milk St.; Pittsburgh, 320 Second Ave.; Detroit, Penobscot Bldg.; Charlotte, Realty Bldg.; Houston, 110 Main St.

Sales Representatives: Buffalo, Denver, Salt Lake City, Huntington, W. Va.; Kansas City, Omaha, Portland, Ore., Los Angeles.

Canada: Storey Pump & Equipment Co., Toronto



MORRIS
CENTRIFUGAL PUMPS

STEEL FORMS
for Streets and Sidewalks

All the bother and expense of building wooden forms is unnecessary—*ready made* Blaw-Knox Steel Forms are kept in stock for quick shipment to you.

They certainly are popular among contractors who do a variety of curb, curb and gutter and sidewalk work—a set of Blaw-Knox Forms can be used interchangeably for all of these jobs.

G. A. Love Sons of San Francisco have been using the same set of Blaw-Knox Forms for nine years—and they're still good. Stephen Kardos of Hudson, N. Y., has been using his Steel Forms for ten years and keeps them working constantly.

Isn't this economy worth something to you?

BLAW-KNOX COMPANY
686 Farmers Bank Bldg., Pittsburgh, Pa.

New York—30 E. 42nd St.
Philadelphia—332 Widener Bldg.
Buffalo—622 Genesee Bldg.
Chicago—Peoples Gas Bldg.
Birmingham—Brown Marx Bldg.
Baltimore—Bayard and Warner Sts.
Detroit—Lincoln Bldg.
Cleveland—516 Union Bldg.

BLAW-KNOX

TRADE MARK REG. U.S. PAT. OFFICE
BLAW-KNOX

BLAW-KNOX BUCKETS - DEPENDABLE - POWERFUL - LASTING

ROAD BUILDERS' EQUIPMENT—STEEL FORMS FOR CONCRETE—FORGE & HAMMER WELDING
STEEL GRATING—CLAMSHELL BUCKETS—STANDARD BUILDINGS—STEEL BINS
STEEL PLANT EQUIPMENT—TRANSMISSION TOWERS

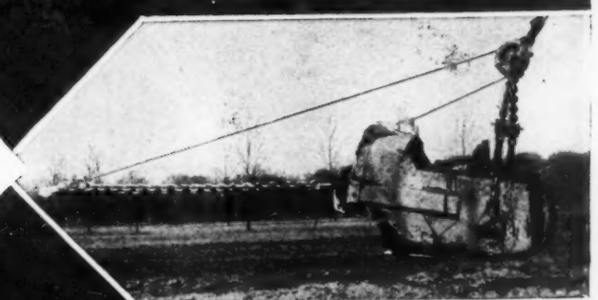
BUILT FOR BATTLE

and built to win battles with refractory materials, all Blaw-Knox Buckets have the "built-in" stamina that enables them to endure hard knocks and come up smiling with big pay loads. There's a type for every service and one that will exactly suit your job. Let our nearest office or agency give you detailed data without obligation.

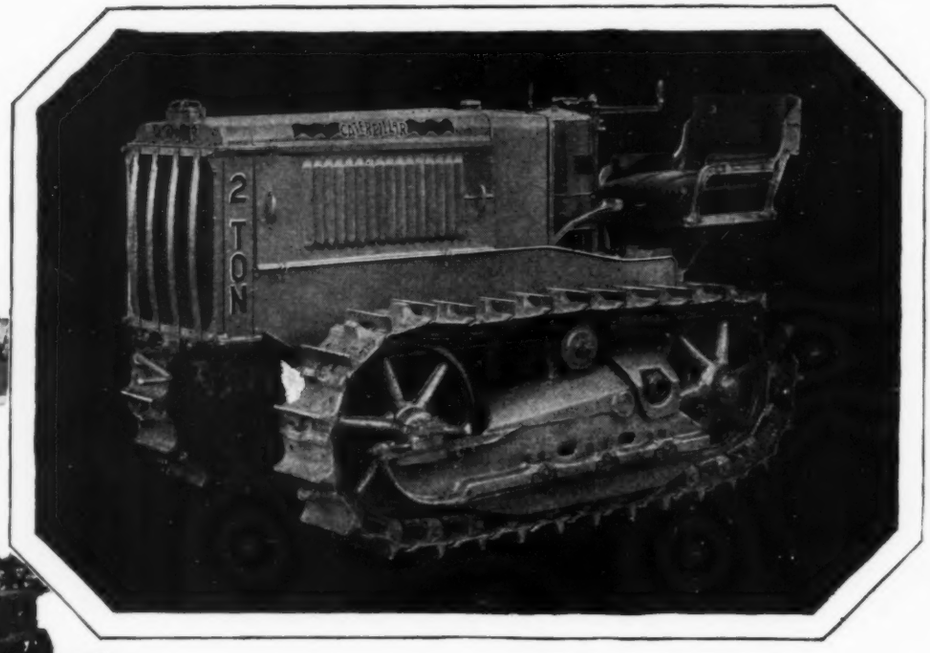
BLAW-KNOX COMPANY
686 Farmers Bank Bldg.
PITTSBURGH, PA.

The Blaw-Knox Dreadnaught—a high powered clamshell for rapid, economical rehandling of stone gravel, slag, sand, etc., and for general excavating and dredging work.

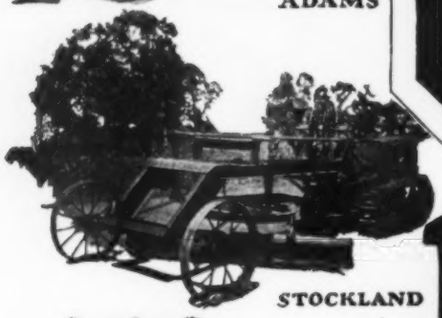
Yes! We also sell Drag-Line Buckets. Eight sizes, ½ to 2 cubic yards capacity. Improved design—increased yardage—less dead weight without sacrifice of strength. Leaflet on request.



BLAW-KNOX



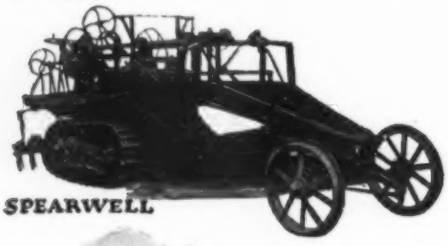
ADAMS



STOCKLAND

1 man maintainers for the 2-Ton "CATERPILLAR" tractor

WESTERN



SPEARWELL

ADD to any one of these compact Maintainers, the power, traction and stamina of the "Caterpillar"—and you have an agile unit that enables one man to smooth mile upon mile of dirt road—*at unbelievably low cost!* See the new "Caterpillar" Rubber Tracks ....

THERE IS A "CATERPILLAR" DEALER NEAR YOU

CATERPILLAR TRACTOR CO.
Executive Offices: San Leandro, California, U. S. A.
Sales Offices and Factories:
Peoria, Illinois San Leandro, California
Distributing Warehouse: Albany, N. Y.
New York Office: 50 Church Street

Successor to
BEST (C. L. Best Tractor Co.) (The Holt Manufacturing Company) HOLT

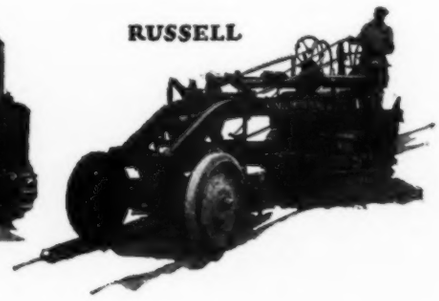
CATERPILLAR
REG. U.S. PAT. OFF.

Prices . . 2-TON, $1850, *Peoria, Illinois*
Thirty, $3000, *Peoria or San Leandro* Sixty, $5000, *Peoria or San Leandro*

SHAWNEE

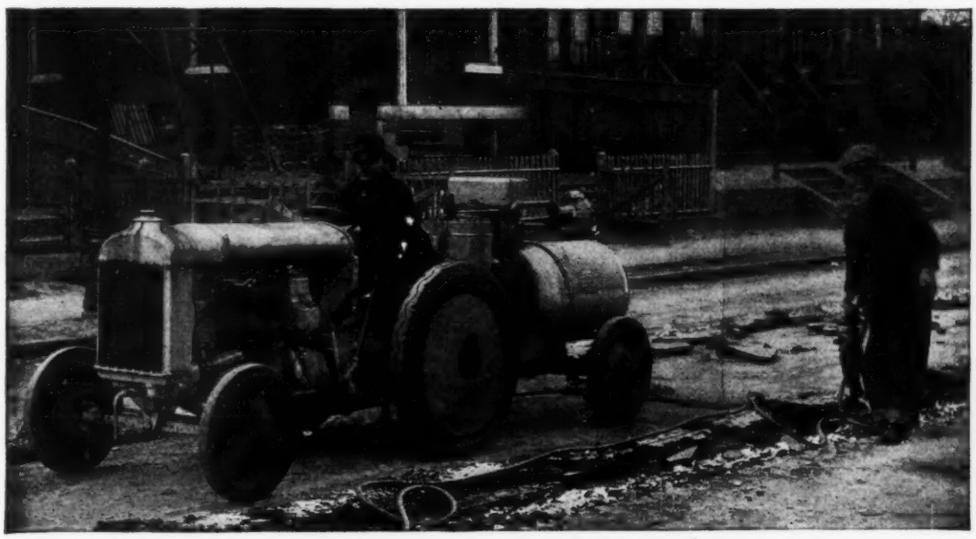
BAKER

HAVELOCK



RUSSELL

6427



How can air be delivered at so low a cost with any other compressor equipment?

In a comparatively few years, the Curtis Portable Compressor, powered and propelled by Fordson, has built up a wide acceptance by contractors on *all classes of work*.

As the need grew for *mobility* in field equipment, two classes of compressor outfits have been offered: (1) semi-portable outfits which can be moved about in a limited way by pushing or pulling; (2) for complete mobility, compressor outfits mounted on expensive motor trucks.

The contractor, therefore, has had a choice only between incomplete outfits or over-expensive outfits. The Curtis Portable Compressor, powered and propelled by Fordson, is the real solution.

Its first cost, even including the price of the Fordson, is far below that of any other comparable unit. Its operation is so economical that it delivers compressed air to the tools at lowest cost, even when portability is not a primary factor.

Curtis Compressors embody heavy-duty, high-quality construction, with unusual durability. The tractor uses cheapest kerosene or gasoline and there is but one engine to look after.

This is the one unit on which you can most safely *standardize*. Due to its great flexibility, it does not require a new equipment investment on each successive job. A thorough investigation will be very convincing!

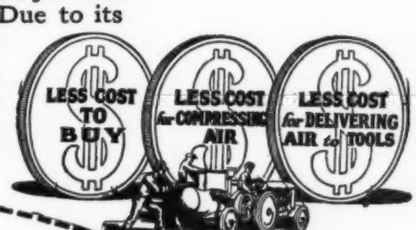
List Price, Curtis Unit Only,

$900 SUBJECT TO DISCOUNT

(STEEL TIRED)

Dealers! Every Customer Wants to See It!

Every contractor with whom you have been in contact today has heard of and is probably considering Curtis Portable Compressors for his work. What an opportunity you are missing if you do not have samples on your floor ready to show and demonstrate! If you will call this wonderfully useful outfit to the attention of all customers, you will secure much business that is now getting away from you.



MAIL COUPON TODAY

Curtis Pneumatic Machinery Company
1995 Kienlen Ave., St. Louis
Branch Office: 518 K Hudson Terminal, New York.

Gentlemen:
Please send at once full information about the Curtis Portable Compressor, powered and propelled by Fordson tractor. I prefer to deal through

(dealer).....

Name.....

Address.....

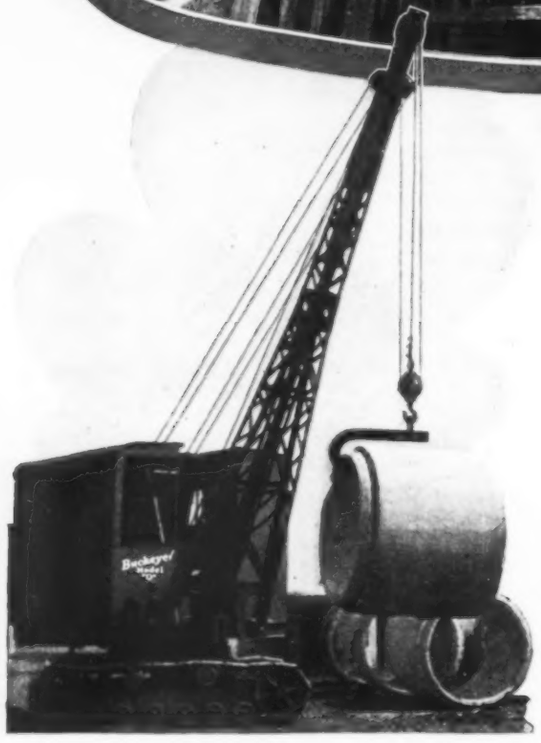
Advise kind of work in margin or by letter.

CURTIS COMPRESSOR PORTABLE

Both powered and propelled by Fordson Tractor

CURTIS PNEUMATIC MACHINERY COMPANY, ST. LOUIS, U.S.A.

Buckeye ~the Leader



Buckeye leadership in the trench excavating field is beyond question. It has been for years.

The giant Model 260, pictured above, has an almost unbelievable digging range. It cuts from 34 to 120 inches wide and to 22 feet deep. The Rotary Auxiliary Cutter or detachable widening device, an *exclusive* Buckeye feature, gives it this marvelous working ability.

The Model "O" Backfiller-Crane, at the left, is a most profitable all-'round helper. While light in weight and speedy in action, yet it has surplus strength and power for every purpose. It is equally useful for backfilling, trenching, pulling sheeting, loading or unloading pipe and handling miscellaneous materials.

All Buckeyes *will* do for you what they *have* done and *are* doing for others.

Attractive illustrative and descriptive literature gladly furnished on request.

THE BUCKEYE TRACTION DITCHER COMPANY
FINDLAY, OHIO

There's a Buckeye Sales and Service Office Near You

Buckeye TRENCH EXCAVATORS FOR OVER 30 YEARS

ONLY THE BARBER-GREENE HAS THE DISC-FEED AND FLOATING BOOM

Smoothing Out the *Ups and Downs*

Rough, uneven ground means little to either the Barber-Greene "42" or "25". For no matter how many ups and downs there are in the pit, yard, or road, the full-length crawlers walk straight across and the floating boom takes care that no twists or strains get to the loader itself.

Combined with the disc-feed that skims the ground for a clean pick-up, these things mean faster loading, fewer repairs, and lower maintenance costs on even the toughest jobs. And they help to show why last year was the biggest loader year in Barber-Greene history—and why this year promises to be still bigger.

BARBER-GREENE COMPANY
530 W. PARK AVE. AURORA, ILLINOIS

25 Loaders 42

B Barber-Greene G

Barber-Greene Loaders

Representatives in 50 Cities

DISC FEED LOADERS VERTICAL BOOM DITCHERS
STANDARDIZED PORTABLE AND PERMANENT BELT CONVEYORS
SNOW LOADERS CAR UNLOADERS COAL LOADERS

By filling out this Coupon you will get a copy of a new book that takes you on a pictorial tour of loading jobs throughout the country. Its title is, "Loading Layouts," and it gives detailed information on interesting construction and loading jobs of every kind. And it may show you the way to cheaper loading.

Send this coupon today. It puts you under no obligation.
BARBER-GREENE COMPANY
530 W. Park Ave., Aurora, Ill.

Name .....

Address .....

City .....

State .....

A Mouthful at Every Bite

THE jungle tiger bites with a fierce energy that always tears away a mouthful. So does the Owen Type "D" Heavy Duty Bucket.

In this sturdy bucket great digging power is combined with speed of operation. Its construction assures long life and durability. With a Type "D" Owen you can be sure of "A Mouthful at Every Bite"... at maximum speed and without shutdowns.

Write us regarding your requirements and we will gladly recommend the suitable type Owen —and explain why this type is best.

Here's a guarantee which goes beyond any ever offered. Why do we give it? Answer: We KNOW *our buckets!*

THE OWEN BUCKET COMPANY
6023 BREAKWATER AVENUE · CLEVELAND, OHIO

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK

Owen Buckets

Some Contractors Have More Time Than Others

MORE time to get around—more time for leisure—more time to think of new ways to make more money.

Such contractors don't fool around with old equipment that delays progress, needs constant attention. They cut this all out—put the most modern mixers on the job. They can then expect their instructions to be carried out and hold their men to completing work on schedule.

If you too are looking for more leisure—more business and profits you will find the most modern and dependable mixers in the Smith line. For little jobs and big ones there is a most economical size to pick from.

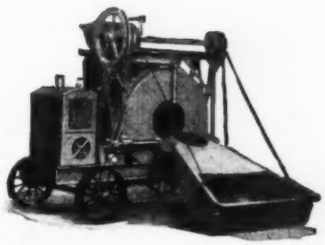
Our catalog is free—it gives the facts and figures on the complete line. Write for a copy today—select the mixer that will work dependably for you. Then you'll have more time for yourself, too. Mail the reminder coupon below.

THE SMITH MASCOT

The Smith Mascot 2½-S Tilter is ideal for the small job and repair contractor who expects to place 25 to 40 cu. yds. of concrete per day.

SMITH 5-S (ONE BAG) TILTER

Holds one bag batch up to 1-2½-4 proportions. Easy one-hand tilting.



SMITH 7-S NON-TILTING MIXER WITH POWER LOADER

One bag capacity 1-3-6. This is the latest model of one of the most popular building mixers of the Smith line.

The T. L. SMITH COMPANY
1084 32nd Street, Milwaukee, Wis.
Sales Offices and Service Stations in All Principal Cities

Tear This Out Now

1084

THE T. L. SMITH COMPANY
Milwaukee, Wisconsin

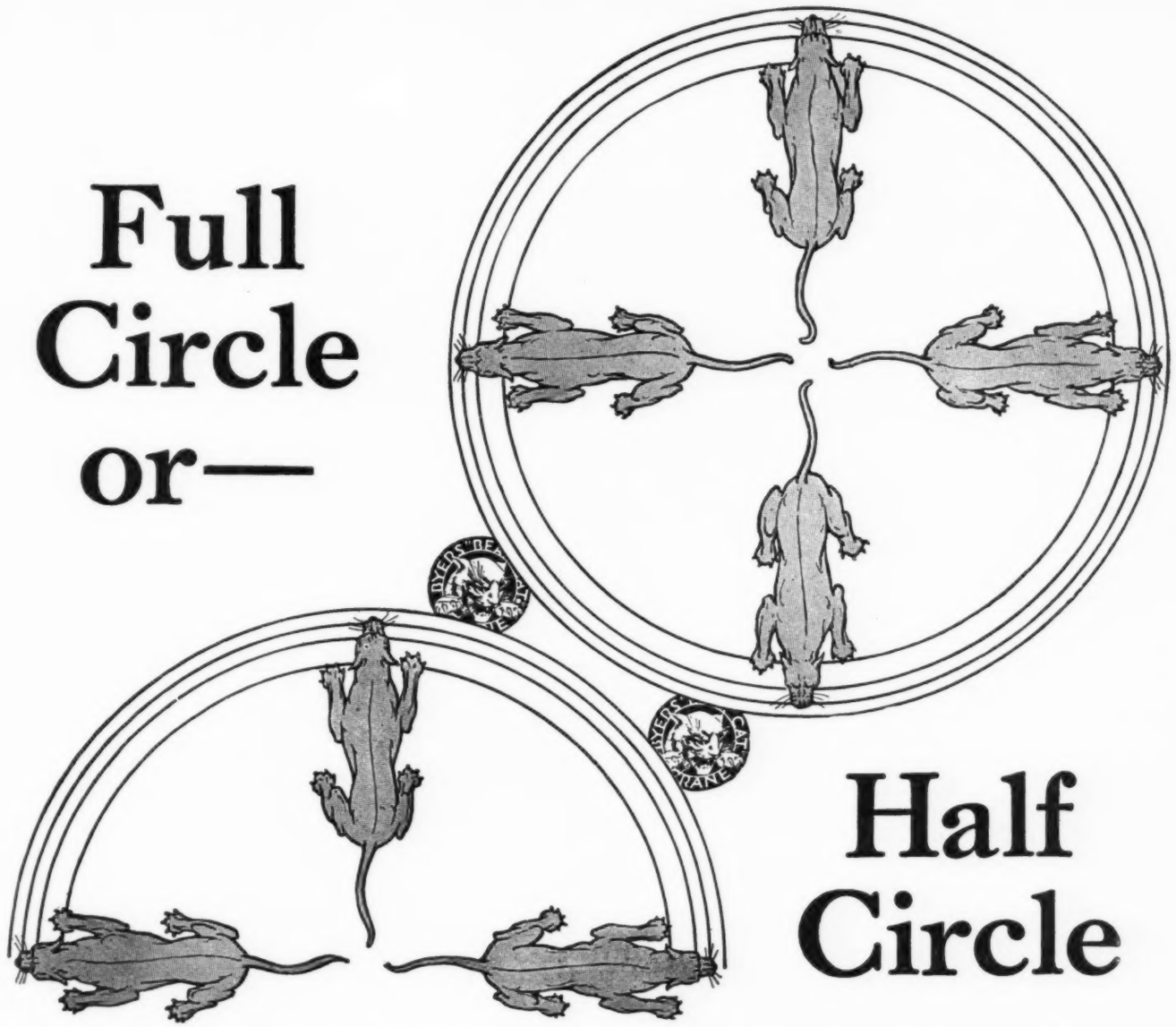
Please send me a copy of your Mixer Catalog No. 526.
We are especially interested in a ..... (Size of mixer) mixer.

Name .....
Address .....
City ..... State .....
Date .....

Smith Tilting Mixers are built in the following sizes: 2½, 3½, 5, 7, 10, 14, 21, 28, 40, 56 and 112 cu. ft. per batch; Smith Non-Tilting Mixers: 5, 7, 10, 14, 21 and 28 cu. ft. per batch; Smith Paving Mixers: 27-E.

SMITH MIXERS

Full Circle or—



Half Circle

Get the machine best suited to your needs

BYERS Bear Cat is made *both* half circle and full circle. Byers is the only shovel manufacturer in a position to give you an unbiased recommendation as to the type of machine best for your work.

You know what the Bear Cat is—a standard, dependable machine with a reputation unequalled in its class. And when you buy a Bear Cat you can be sure of getting the right machine for your work—either full circle or half circle swing.

BYERS MACHINE COMPANY, Ravenna, Ohio

Builders also of Byers Truckrane — *Sales and Service Throughout the Country*

WIRE, WRITE OR SEND THIS

BYERS MACHINE CO. Ravenna, Ohio.

Gentlemen:—
Please send me the new Bear Cat Book. The type of work I am particularly interested in is

Name

Address

Town

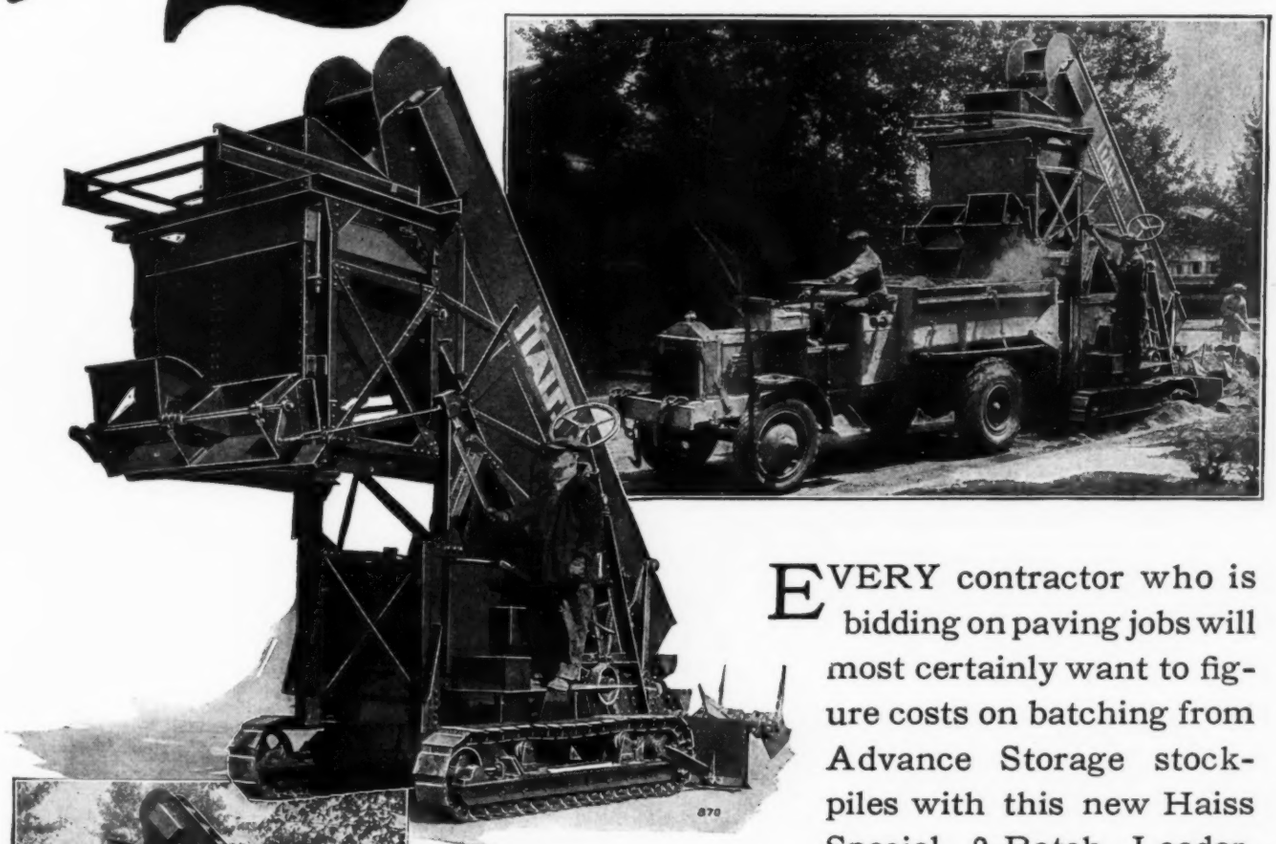
State

C.M. 7-27

BYERS BEAR CAT

HALF CIRCLE AND FULL CIRCLE SWING

A 2 *for* 2 Batch Loader Batch Trucks



(At the top) Batching sand into 2-batch Super-Trucks with the Haiss 2 Batch Loader and (just above) the similar Loader on stone. R. R. Anderson Co., Chicago, Ill.

EVERY contractor who is bidding on paving jobs will most certainly want to figure costs on batching from Advance Storage stockpiles with this new Haiss Special 2-Batch Loader. Used with double batch trucks it cuts out the time waste of waiting for a Loader to re-load a single-batch hopper. Time is money—and a Haiss saves it in loading, strike-off and batch discharge.

Ask us to send you the details on the 2-batch Haiss Loader.

The George Haiss Manufacturing Co., Inc.
139th Street and Rider Avenue
New York, N. Y.
Representatives Throughout the World

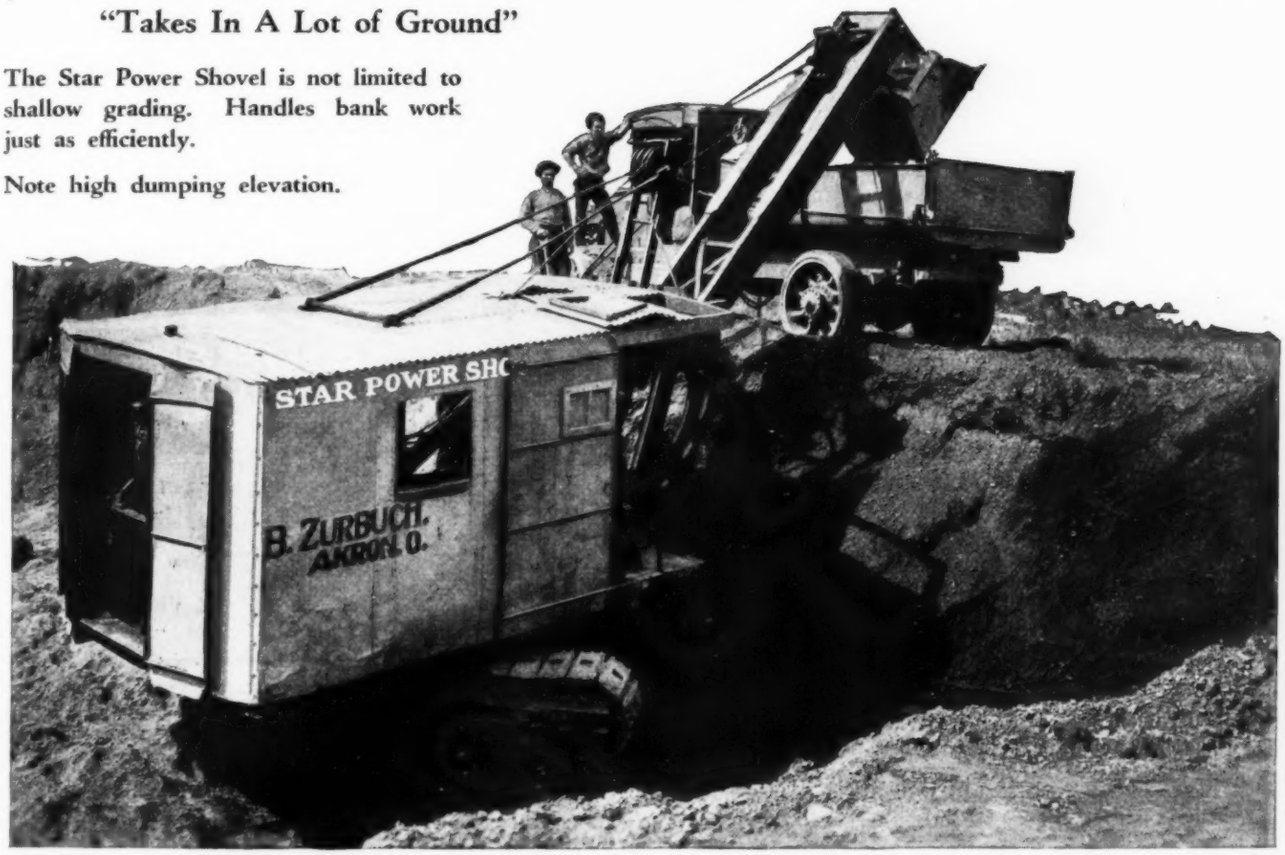
HAISS

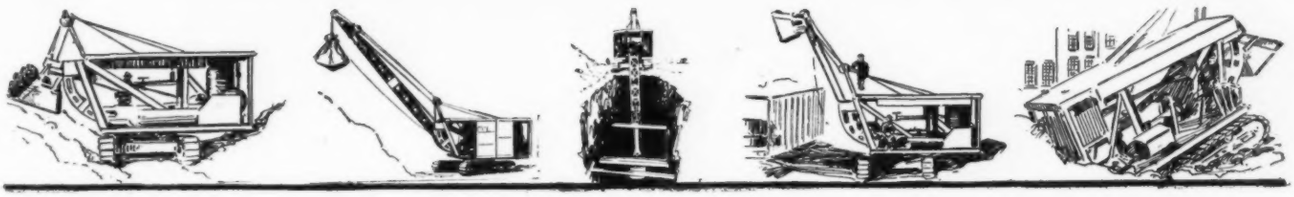
The Versatile and Efficient
STAR POWER SHOVEL

"Takes In A Lot of Ground"

The Star Power Shovel is not limited to shallow grading. Handles bank work just as efficiently.

Note high dumping elevation.





A 17-ton Power Shovel for all kinds of Jobs:

GRADER—DIPPER

¾-yard skimmer bucket.
Dumps 17 feet in clear in 15 ft. radius.
Maximum width of cut— 42 feet.
Capacity— 300 to 600 yards per day.

TRENCHER

Digs— 18 feet deep.
Width— 22 inches to 30 feet.
Dumps— 12 to 14 feet in the clear.
Bucket never rides on heel.

WITH CLAM SHELL

Uses ½ yard bucket with or without teeth.

With	19-foot boom	30-foot boom
Swings clear	11 feet	20 feet
Carries	5000 lbs.	4200 lbs.
In radius	18 feet	25 feet

Boom raises and lowers.

Is Full Revolving
Has Full Length Crawler
A One-Man Shovel

Equipped with electric self starter, mechanical trip, which trips both skimmer and ditcher bucket at any position, moving or standing.

Also traction lock.

Send the coupon for the latest Star Bulletin No. 51

The Star Drilling Machine Co.
Akron, Ohio

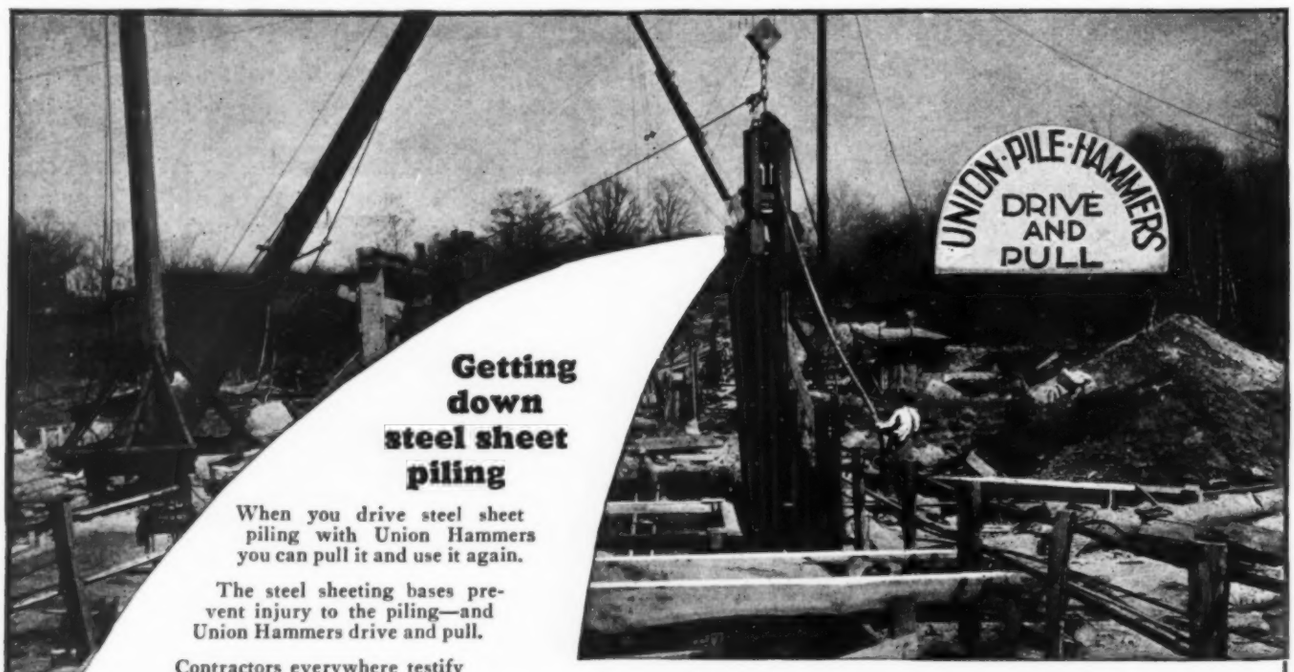
The Star Drilling Machine Co.
510 Washington Street, Akron, Ohio

Send Star Power Shovel Bulletin No. 51 for the following:
Grading Equipment— Trenching Equipment— Crane and Clam.

Name .....

Address .....

CM-727



Just Another Proof — of LINN Performance!

Here was a job that called for steady plugging! What was more natural than the choice of a Linn fleet? The Brewster Company had heard about *Linns* just as everyone has who keeps posted on the methods employed on big contracting jobs. They tried them and having given them a workout on a job which presented unusual difficulties they have nothing but praise to offer.

Just another proof—that's all!

Note: We are carefully extending our representation and invite inquiries from responsible distributors of contractors equipment.

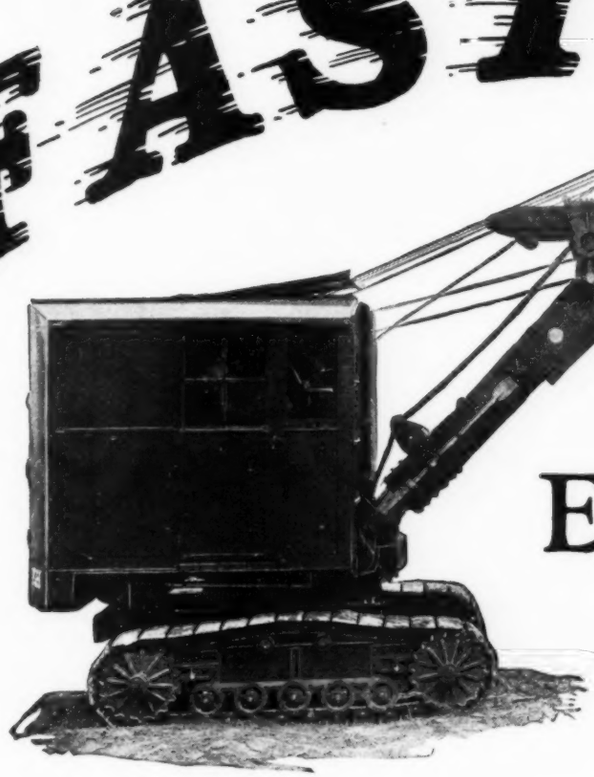
LINN MANUFACTURING CORPORATION, Morris, N. Y.

New York Office—507 Fifth Ave., Room 507—Murray Hill 5021, 5022

Mussens, Ltd., Montreal—Canadian Distributors

LINN
MANUFACTURING CORPORATION
TRACTORS

FASTEST



½ Cu. Yd. EXCAVATOR

Full Revolving
NO LOST TIME

Powerful 50 H. P. Motor
Swings 5½ Revolutions per min.
Line speeds—155 ft. per min.
High Speed Boom Hoist—Triple Safety Locks
P & H Powerful Positive Patented Crowding Motion
P & H Easy Power Clutch Control
P & H Quality Built All the Way Through

* * * * *

The result is more dirt moved per day.

Use the reminder coupon now. A copy of new Bulletin GH-1 will be sent by return mail.

P&H

GROUND HOG EXCAVATOR

Shovel
Crane
Dragline
Pile Driver

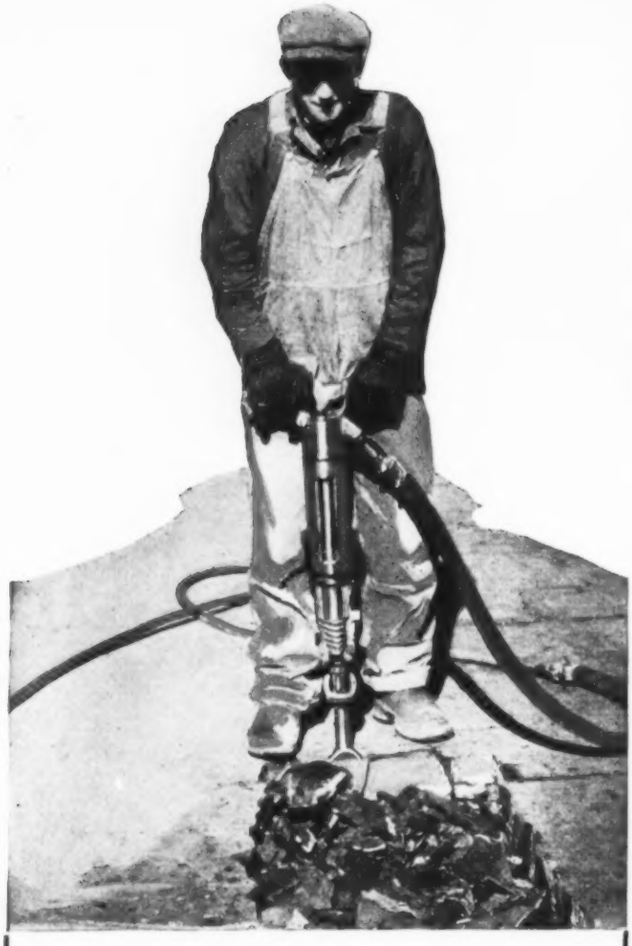
HARNISCHFEGER CORPORATION
Established in 1884
3894 National Avenue, Milwaukee, Wisconsin

New York, Chicago, Charlotte, Pittsburgh, Los Angeles, Atlanta, Philadelphia, Kansas City, Detroit, Portland, Seattle, Tampa, Birmingham, San Francisco, Dallas, Memphis, Jacksonville, Miami, Indianapolis, St. Louis, Minneapolis

WAREHOUSES AND SERVICE STATIONS
Philadelphia, Memphis, Jacksonville, San Francisco, Los Angeles, Seattle

HARNISCHFEGER CORPORATION
3894 National Avenue, Milwaukee, Wis.
Please mail me a copy of the P & H Ground Hog Bulletin GH-1. No obligation is assumed.
Name.....
Address.....
City..... State.....

P&H GROUND HOG
ONE-HALF YARD GASOLINE EXCAVATOR



Shattering
stone and time

Here you see a Cleveland C6 Paving Breaker cutting stone block paving. A recent competitive test showed that the Cleveland C6 outcuts others. It is, therefore, shattering time here no less than stone.

Put this record-breaker on your demolition work and note the saving in time and labor. Note how it *stays on the job,* too.

That's because it's designed and built right—being a Cleveland Air Tool.

Bulletin 4463 describes the Paving Breaker and other Cleveland Air Tools—Sinkers—Clay Diggers, Backfill Tampers, Calking Tools. Every live contractor needs some of them. Write for the Bulletin.

The Cleveland Rock Drill Co.
3734 East 78th Street, Cleveland, Ohio

Chicago, Ill., 608 S. Dearborn St.
Detroit, Mich., 428 Insurance Exchange Bldg.
New York City, 30 Church St.
St. Louis, Mo., 2091 Railway Exchange Bldg.
Philadelphia, Pa., The Bourse Bldg.
Birmingham, Ala., 403 N. 24th St., Box 2028.
Pittsburgh, Pa., 922 Farmers Bank Bldg.
Negaunee, Mich., 222 Heath St.
British Representative: John MacDonald & Company, Pollokshaws, Glasgow, Scotland

CLEVELAND ROCK DRILLS

SMALL MACHINES that do BIG WORK

PULLMCO Puller-Jacks

For Pulling, Moving Lifting and Placing

ALL STEEL PORTABLE COMPACT
SIMPLE DEPENDABLE

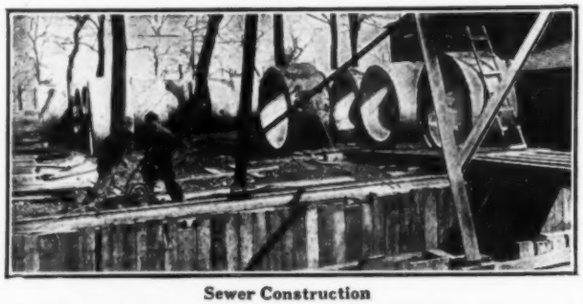
MODEL 1	MODEL 2
SIX SPEEDS	THREE SPEEDS
*CAP., 12 TONS	*CAP., 8 TONS

*PULL ON A SINGLE CABLE

Puller Jacks are ready for use wherever there is anchorage to which a hook or a cable can be secured. They will work in any position and require less setting up and operating time, less man power and less tackle, than any other hand power pulling device.

Puller Jacks multiply the strength of one man 50 times. They are ideal tools for construction, wrecking, house moving, land clearing and material handling and many other purposes.

Car Spotting



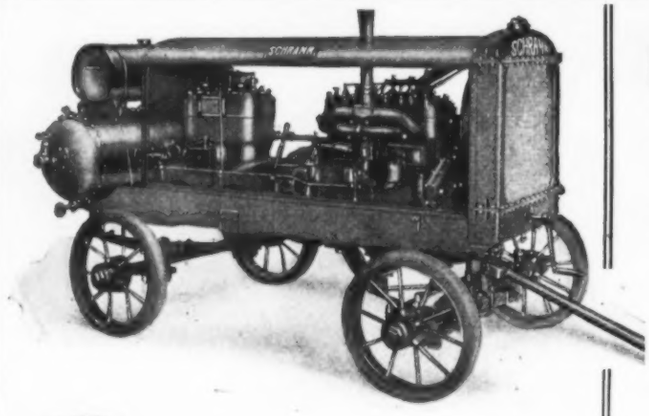
Sewer Construction

Pulling Mixer Over Soft Ground

RUSH THE JOB—NOT THE MAN!

WRITE FOR ILLUSTRATED BOOKLET

PULLER MANUFACTURING CO.
600 WEST 57TH ST., NEW YORK



Compressors—
for every contracting and engineering job—

We supply the field with portable compressors for every need, in many types. A big job! But judging from the demand, the repeat orders, and favorable comments from users, Schramm Compressors have made good in a big way. And no wonder.

Powerful Buda engines, each equipped with clutch, governor (a *real* feature) and gas strainer (keeps dirt *outside*), stand up under the worst abuse.

The simple, large capacity compressors keep your tools supplied with full pressure—economically.

Mounting—whatever you want.
Let's cooperate and talk it over.

Sizes—60, 120, 180 and 240 Cu. Ft. Gas, electric or belt drive. Truck, trailer, skid or tractor mounted.

Get the catalog.

Schramm Inc., Manufacturers

West Chester, Penna.

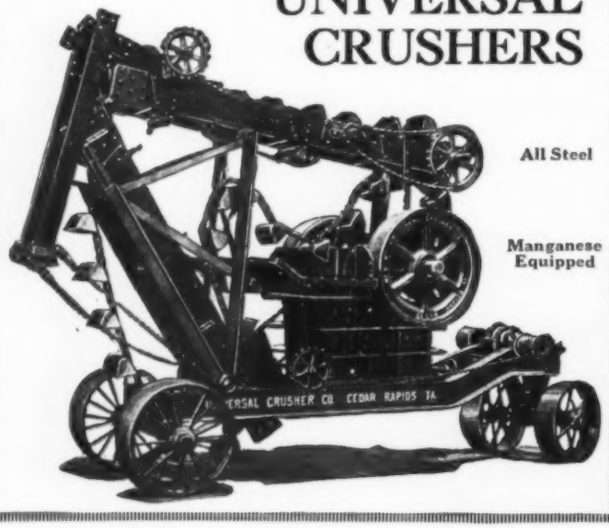
Offices and Representatives in Principal Cities

Large capacity— and portability

Here is another type of UNIVERSAL Crusher that represents maximum efficiency in its type. This Style H H crusher outfit consists of crusher mounted on steel truck with folding elevator, without power. Cut under frame of one piece I beams. Elevators furnished with steel or wood frames with buckets of various styles. Write for literature describing 22 sizes of Universal Crushers.

UNIVERSAL CRUSHER CO.
327 8th St. West, Cedar Rapids, Iowa

UNIVERSAL CRUSHERS



All Steel

Manganese Equipped

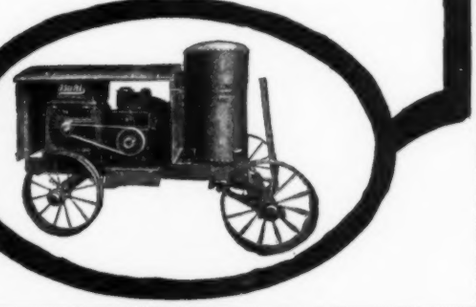
Buhl
AIR COMPRESSORS

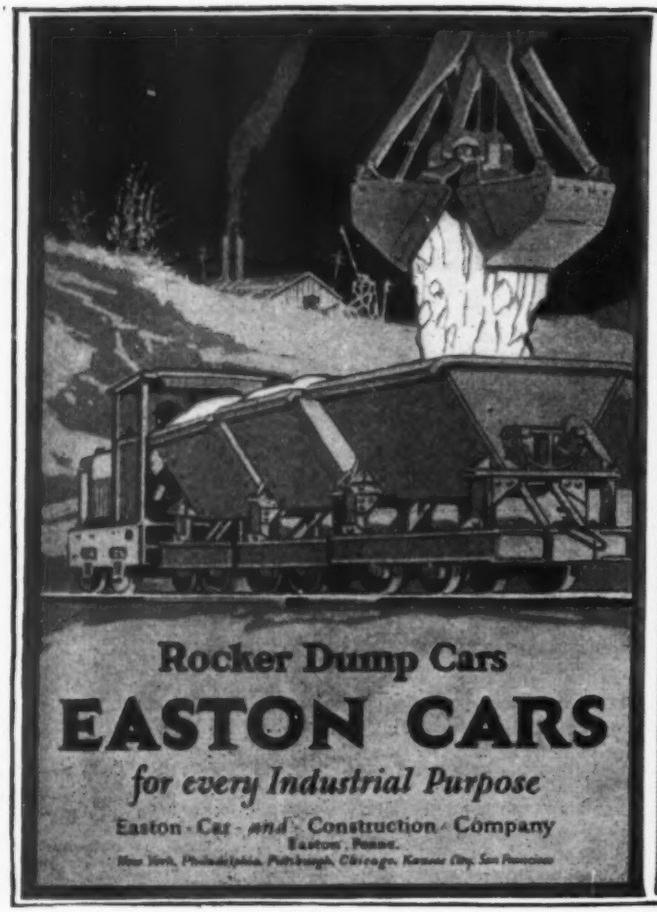
Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

THE BUHL COMPANY
Manufacturers
37 W. Van Buren St., CHICAGO





Rocker Dump Cars

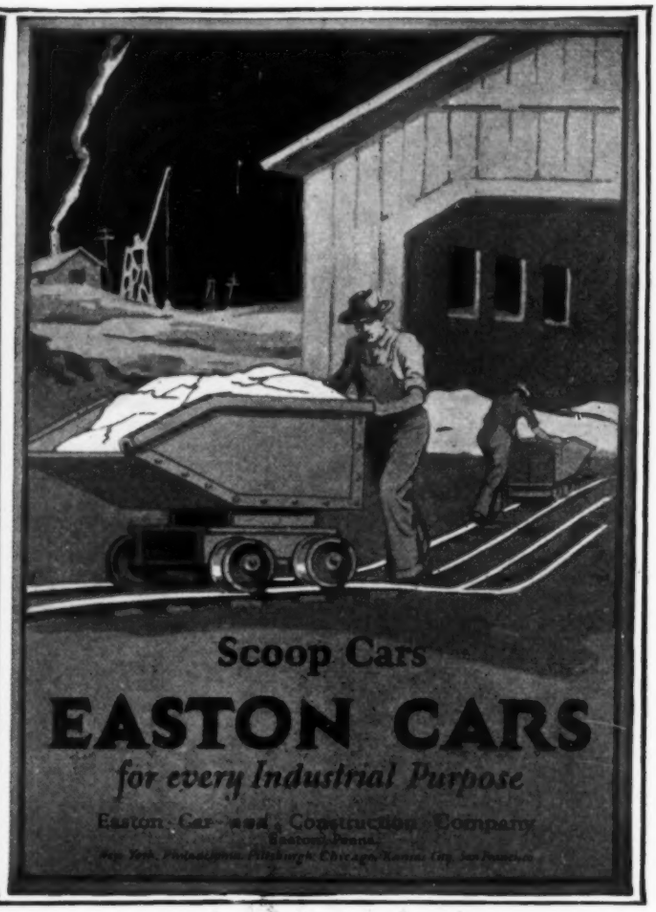
EASTON CARS

for every Industrial Purpose

Easton Car and Construction Company

Easton, Penna.

New York, Philadelphia, Pittsburgh, Chicago, Kansas City, San Francisco



Scoop Cars

EASTON CARS

for every Industrial Purpose

Easton Car and Construction Company

Easton, Penna.

New York, Philadelphia, Pittsburgh, Chicago, Kansas City, San Francisco

When on Rock Excavation and the Work Goes Slow

MID-WEST Gasoline Locomotives

will hurry the stuff away when you get it on the cars. They will keep on doing it, too, all day long and all through the job.

Because

They are built for that kind of service and not to make you wonder how you will move the stuff tomorrow.

They are not built "to just get by" but to leave fond memories when the job is done.

Built in sizes from 3 to 25 tons. Let us tell you more about them.

Mid-West Locomotive Works
Cincinnati, Ohio

Do the job with Metaforms save time and labor—cut costs

METAL FORMS CORPORATION

Milwaukee, Wis.

"Sullivanize" Your Drill Steel

Sullivan Drill Steel Furnace

The Sullivan "GF-2" Furnace, illustrated above, supplements the work of the Sullivan Sharpeners in shaping and tempering drill steel. Proper heating of the steel is recognized generally as an important factor in reducing the cost of rock excavation.

This furnace heats the steel gradually and uniformly, with no danger of over-heating. It will handle thirteen 1¼ in. bits at a time. It is economical of fuel (oil or gas) and of compressed air. It can be adjusted to heat any portion of the steel desired. Pyrometer control is available on these furnaces, and enables all steels to be heated to the exact temperature desired for either forging or tempering.

Write for Catalog 3874-C.

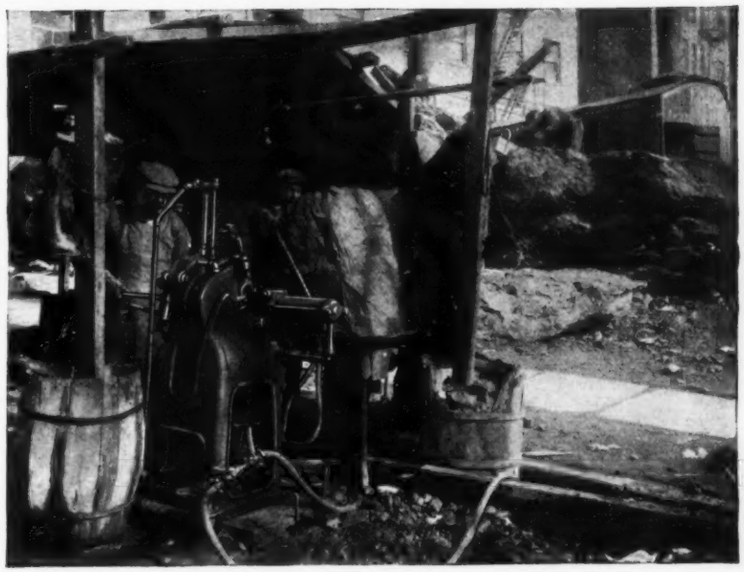
Sullivan "A" Sharpeners

The picture above shows one of the Sullivan "A" heavy duty Drill Sharpeners, and one of the Sullivan Furnaces at the Cascade Tunnel of the Great Northern Railway.

The five Sullivan Sharpeners, and six Sullivan Furnaces on this job are important factors in establishing a series of remarkable tunneling records. The All-Hammer forging of the Sullivan Sharpeners makes the drill steel tougher with every sharpening, enabling it to drill farther without resharpening, and reducing breakage.

In addition to making bits and shanks to 3½-in. gauge, the vertical hammer of the "A" Sharpener can be used to forge pins, bolt heads, ship irons, spikes, lag screws, and other pieces.

Write for Catalog 3872-J.



"C" Sharpener Dressing 1-in. steel for a building excavation job in the Bronx, New York City. Pasquale Diminno, Contractor.

New Sullivan Portable Drill Sharpener

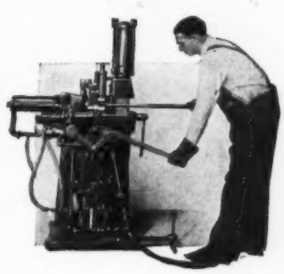
Here is a new Sullivan Drill Sharpener which fills a distinct want of many contractors and quarries. It is light, easily transported, uses little air, sells for a low price. But it is a real sharpener. It incorporates the advantages of the heavy duty "A" Sullivan model, and, within its capacity, is just as accurate and even more rapid.

This Type "C" Sharpener weighs only 1,100 lbs. and is easily handled when moves are necessary. It rapidly makes or resharpens any ordinary hammer drill bits, up to 2½-inch gauge, on ⅞-inch or 1-inch solid or hollow steel; or forges collar shanks; and pick and chisel points and concrete breaker shanks on 1⅛-inch steel.

The Type "C" Sharpener may be operated by a Sullivan Portable Air Compressor, without interfering with the use of drills or concrete breakers on the same line.

All-Hammer Action

Powerful, fast-hitting air hammers upset and swage the steel under tool steel dollies and dies, by the distinctive Sullivan All-Hammer action. This hammering lends new toughness and cutting capacity to the bit with each sharpening.



Ask for Catalogue 3872-I.

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Always a Job to Keep it Busy

THE City of Akron, Ohio, put their Browning Gasoline Crawler Crane right to work on a heavy duty job, handling 4½ ton iron pipe —unloading them from the cars, storing, and handling for re-distribution.

They have kept the crane busy every minute, and its all-'round usefulness and remarkable performance on this work has pointed the way to a score of other uses which will keep it busy constantly.

That's one thing about a Browning—you can use it on any kind of a handling job, anywhere, and move it quickly and easily under its own power.

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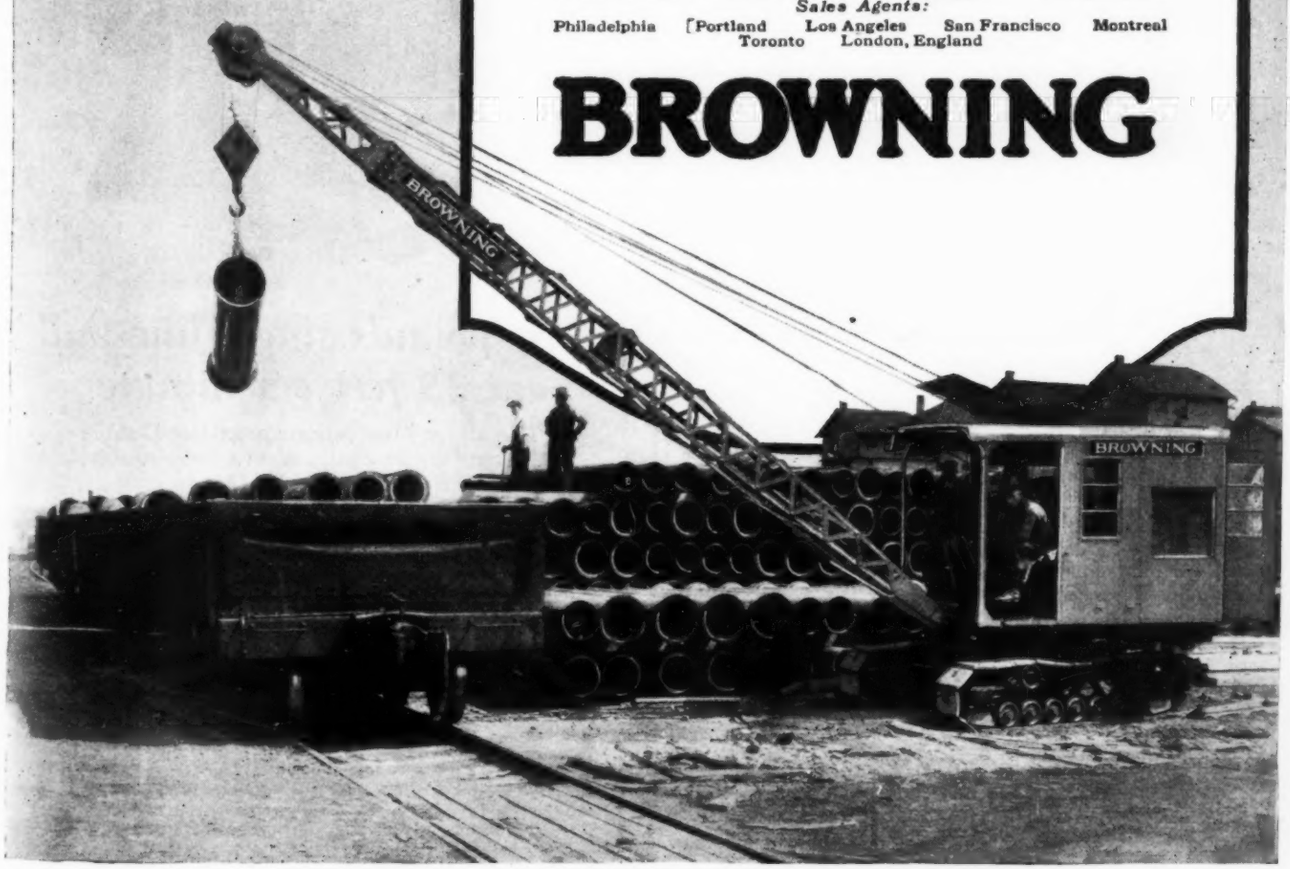
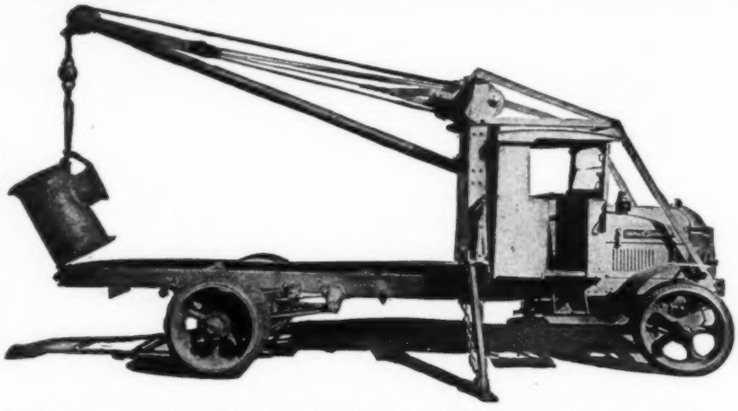


AUTO TRUCK DERRICK

HOISTS--LOADS--DIGS



CONVERT your truck into a TIME and LABOR saver with this derrick. It will serve many purposes if mounted on a chassis of sufficient tonnage.

With HOOK or CHAINS, it lifts pipes, girders and other solid objects. With LAZY TONGS it handles barrels, bales, boxes, crates, etc. With CLAM SHELL or ORANGE PEEL bucket it loads stone, gravel, sand, coal and other soft or loose material.

ONE OPERATOR standing on truck has absolute control over the load and its placement.

The construction of this derrick is such that it can be knocked down, packed compactly and shipped anywhere. Derrick has large factor of safety over specified capacity. Protection from breakage due to overload is insured by patented slipping clutch set to lift slightly in excess of rated capacity.

Operation of clam or orange peel bucket is simple, any unskilled workman can operate this machine and it will also do the work of vertical hoists on trucks for raising and lowering body.

Prices and fuller details will be sent on request. Certain territory still available for first class Distributors. Correspondence invited.

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to Lower Hoisting Costs

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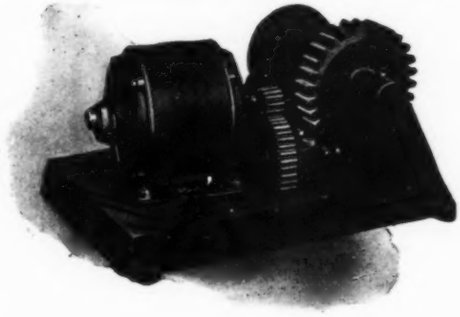

500 pounds single line pull at 25 feet per minute

The above illustration shows the Dobbie Worm Winch with a one hp. motor. Note the performance of this unit.

This is an efficient worm-geared winch where a power-driven machine is preferred to hand operation.

The motor is reversed to lower.

Further particulars gladly submitted.

Dobbie Foundry and Machine Co.
Niagara Falls, N. Y.

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PICK UP CARTS — DERRICK FITTINGS
SULKY DERRICKS — WINCHES ALL TYPES

Speed-Speed-

1 a batch in the skip
2 a batch in the drum
3 a batch in the bucket

THE Standard Bitulithic Co. of New York City, owners of 6 MultiFoote pavers are here demonstrating paver speed. This is made possible by the unequalled vision that comes with the high operating platform and the long levers, grouped, easily reached and easily thrown, that allow the maximum in overlapping operations. The MultiFoote is built to get concrete on the road. That is why the leading contractors buy them year after year.

The Foote Company, Inc.
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World's largest exclusive builders of road pavers.

MULTIFOOTE
The Paver that [illegible] Bearings

A year ahead will mean money to you

One year before any other manufacturer Foote put a 6-bag paver on the market. A year later and still a year ahead Foote installed Timken bearings and used the first six-cylinder motor on a paver. Foote did the testing and took the punishment, but that year of perfecting will mean dollars in your pocket now—send for the booklet "One Year Ahead."

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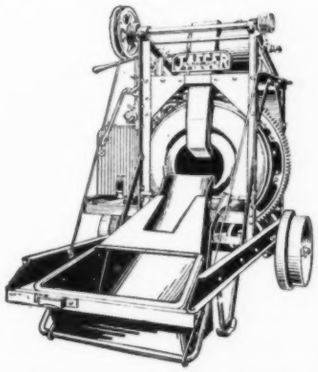
"SPEED KING"
ONE BAGGER
"100% ROLLER BEARING"



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Jaeger "Speed King" Mixer is easily the most compact, portable and fastest one bagger built — It's 100% Roller Bearing equipped — Lighter yet stronger — End discharge type to fit all jobs — comes with famous Jaeger Accurate Measure Water tank — Pat'd "Skip Shaker" — Dual Tire wheels — Auxiliary springs — One man can lift this perfectly balanced machine — Banked controls.

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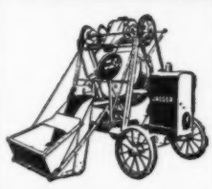

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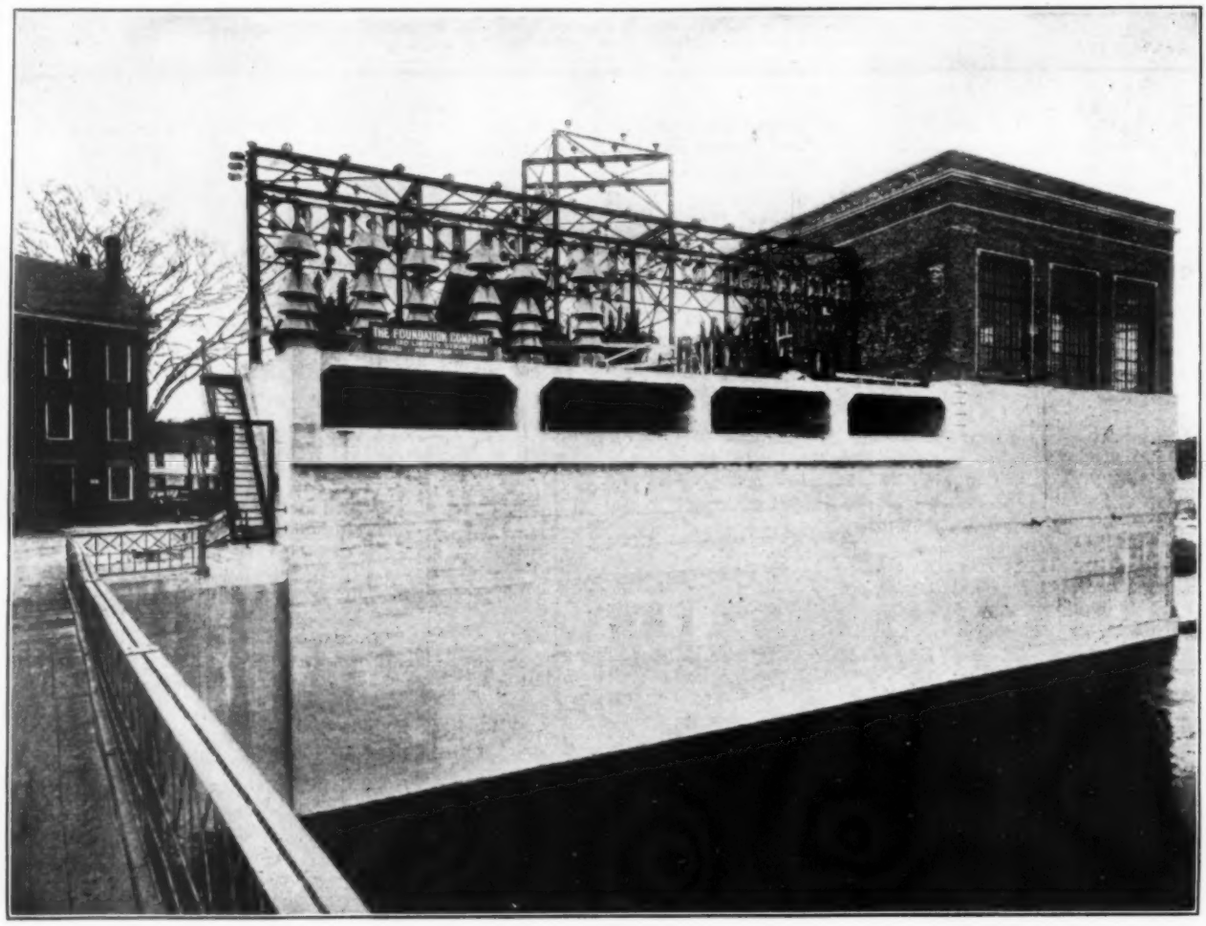

Addition to Hydro-Electric Plant *West Buxton, Maine*

Cumberland County Power and Light Company
The Foundation Company, General Contractor

The existing Hydro-Electric Plant at West Buxton, Maine, was not utilizing the available stream flow. New units, partially shown above, were built to use it. Because of existing local conditions the plans contained many unusual features. The Foundation Company commenced construction on May 19, 1926 and the unit went into operation January 26, 1927.

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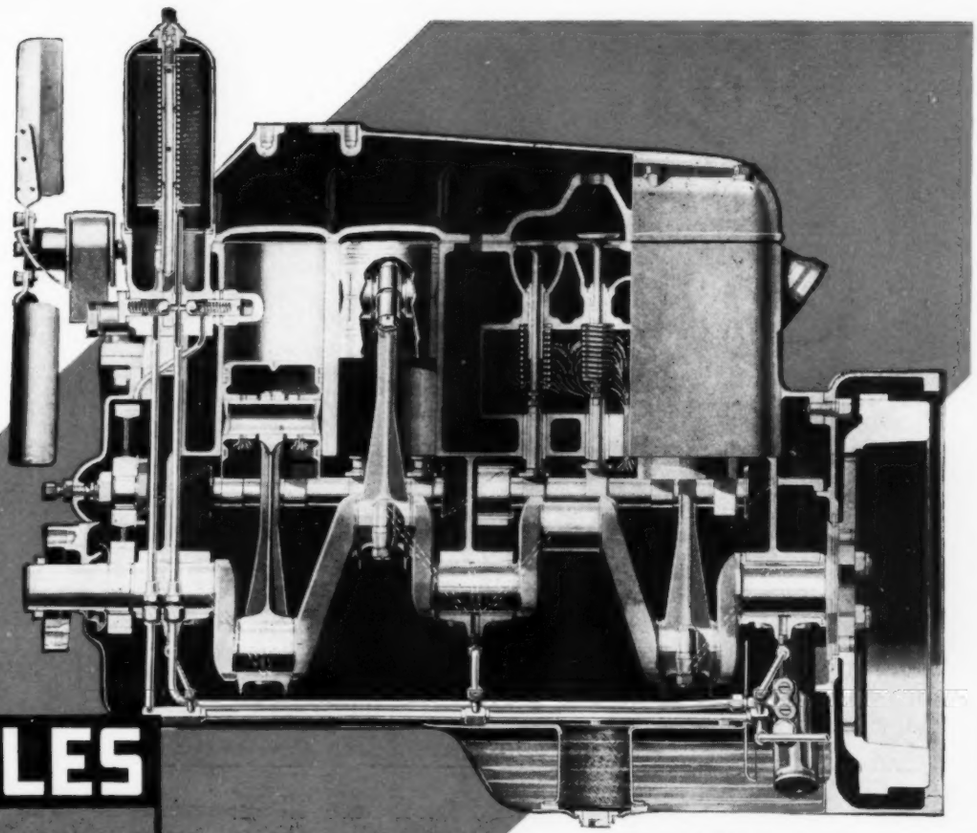
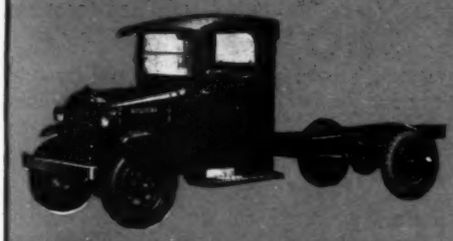


Sectional side elevation of the Hercules Engine, equipped with oil filtrator, showing complete lubricating system.

HERCULES



ENGINES

"and, of course, Hercules Engines."

It is significant—and natural—that the first consideration in the purchase of a motor truck is its engine.

The engine—the power plant—can "make or break" the opinion the operator holds of the truck.

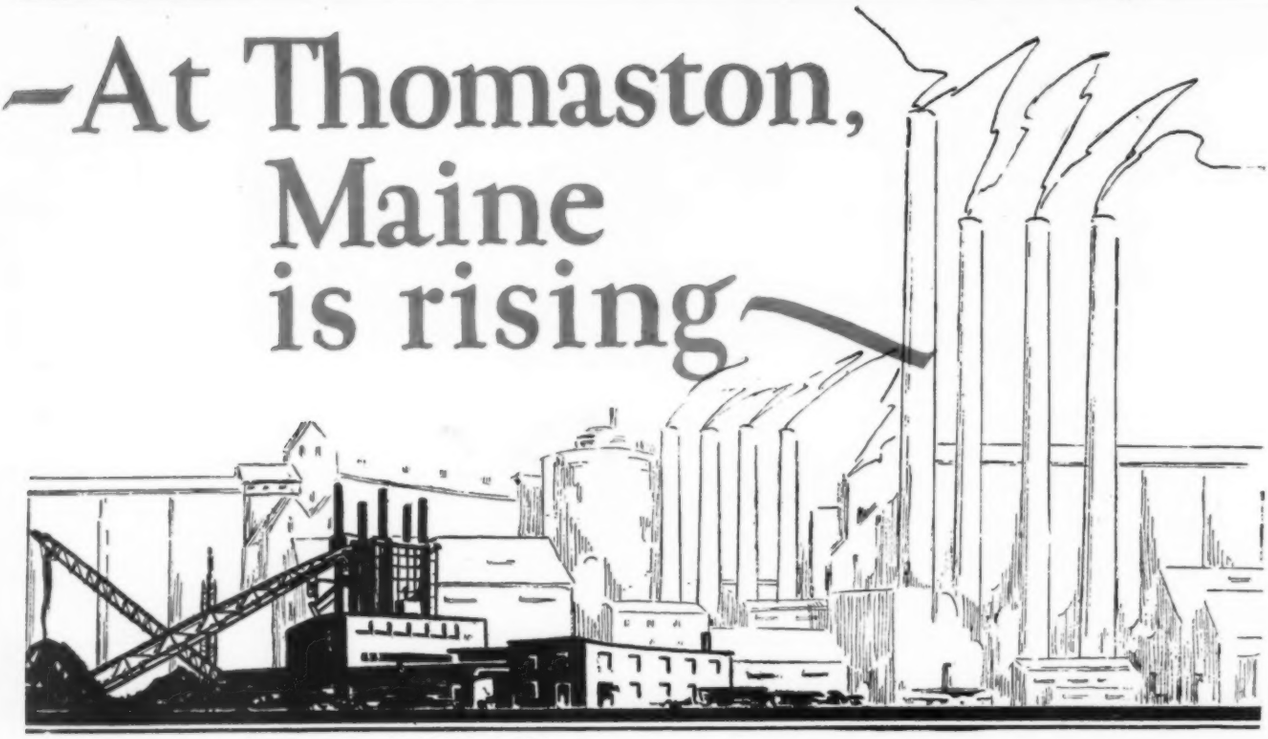
Every question of engine performance is completely and satisfactorily answered when it is said,

"—and, of course, Hercules Engines."

HERCULES MOTORS CORPORATION, CANTON, OHIO, U. S. A.

HERCULES

—At Thomaston, Maine is rising



FOR years New England has prophesied that some day a great cement mill would rise upon its soil to bring a superior cement to the very doorstep of New England industries.

And now—the prophesy is coming true! At Thomaston, Maine, is rising one of the finest mills in the world—New England's own and only cement mill!

The Thomaston mill will have a yearly capacity of a million barrels of Dragon Cement. Until this new mill is in operation, Dragon Cement will be supplied to New England as usual, from the great mill at Siegfried, Pa., the largest single-unit cement mill in the Lehigh Valley.

It is the quality—the super-standard quality of Dragon Cement—that has made this additional million barrel Dragon Mill possible.

For over a generation, Dragon Cement has sustained its reputation as "The Cement Supreme" — up FROM—not merely up TO—the standard cement specifications.

Not a single bag of Dragon has been rejected by any testing laboratory for years and years. All seven and twenty-eight day comparative tests published by independent laboratories have demonstrated the superior strength of Dragon.

Dragon is famous for strength, speedy hardening, fineness and uniformity. These are the qualities that have built the demand which now justifies a new mill in New England.

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Dragon

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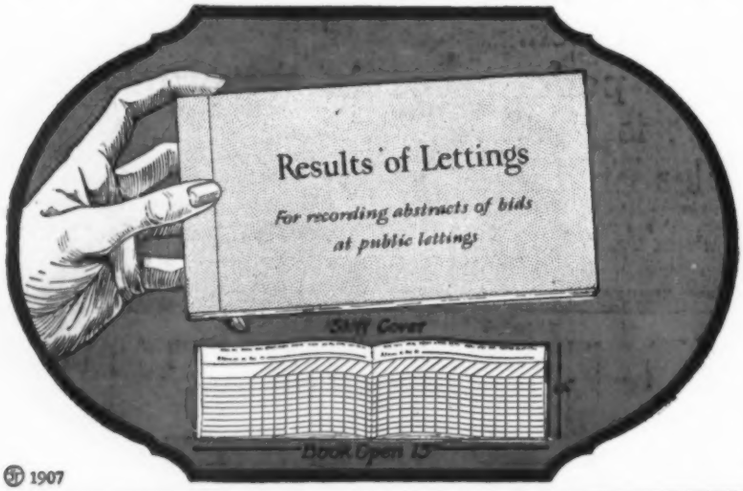
On your work in New England and elsewhere in the East, use Dragon Portland Cement and get the plus value of Dragon.

You get it at no added price. It speeds and improves the job.



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